INCLUDING: ST PRODUCTS, PROGRAMS, NEWS, HELP Page 49

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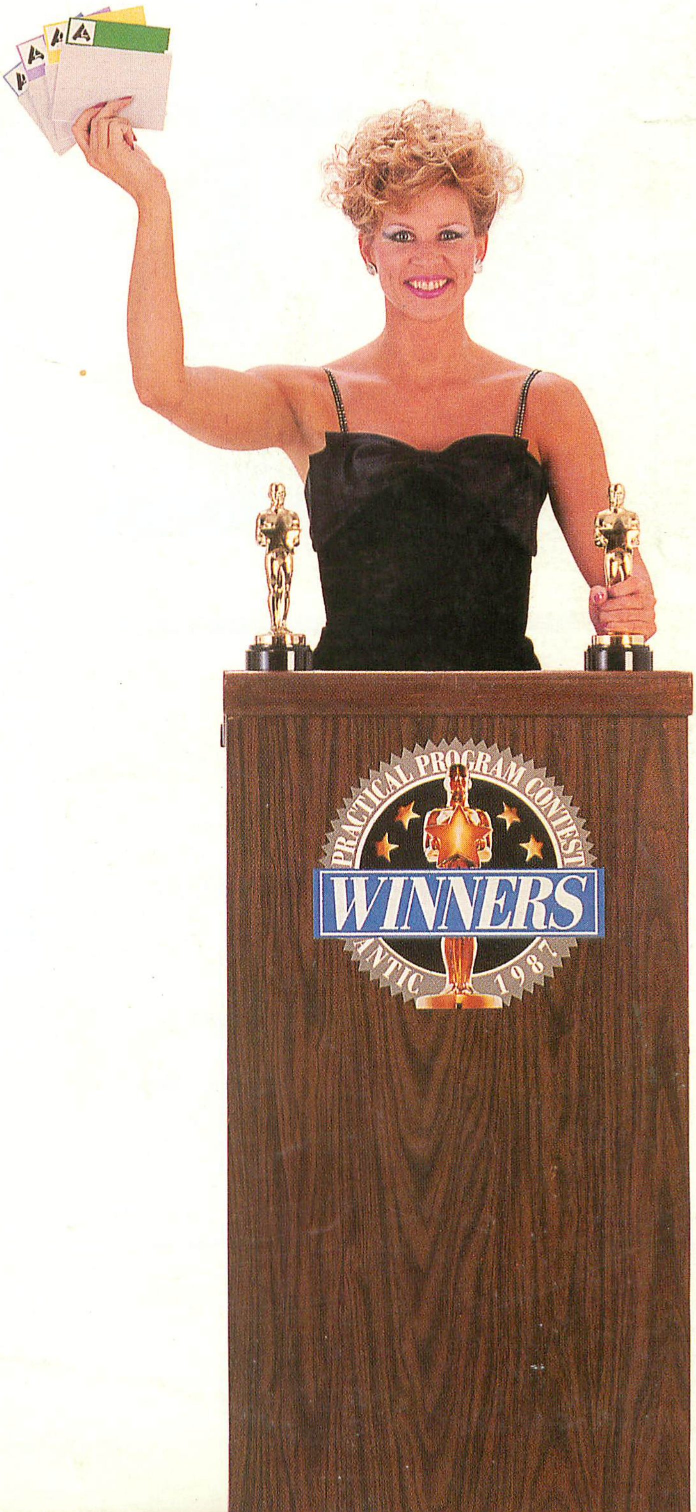
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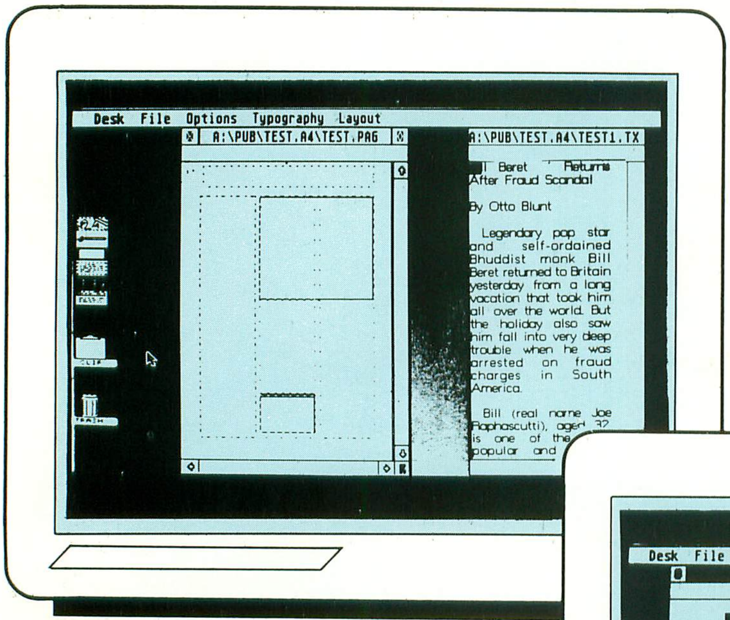
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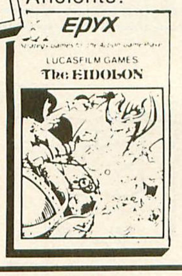
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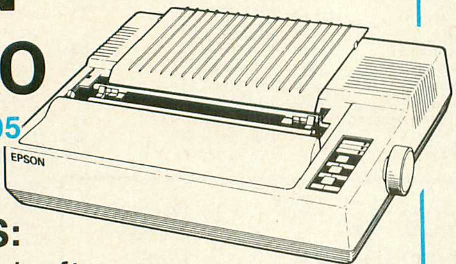
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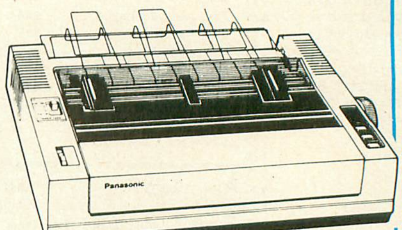
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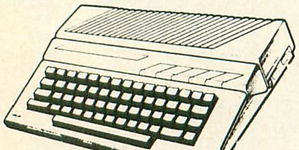
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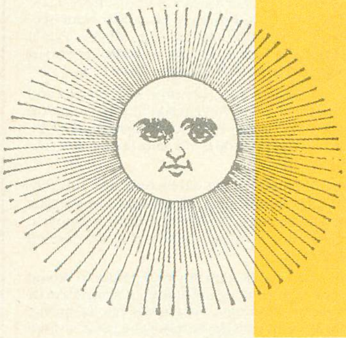
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ST RESOURCE



ST RESOURCE/49

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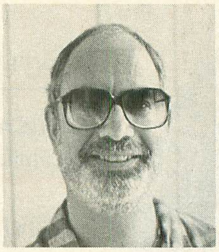
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Editorial submissions should include text and program listings on disk and paper. Submissions will be returned if stamped, self-addressed mailer is supplied. **Antic** assumes no responsibility for unsolicited editorial material.

Editorial

Practical Applications Winners



This issue features the four winners of **Antic's** first 8-bit Practical Applica tions Contest. We received close to 200 entries during the six months that the contest was open. And at least half of the entries arrived during the final two weeks of the competition.

It was extremely heartening to see such an outpouring of programming talent for the 8-bit Atari. We accepted over 30 of the program entries for publication, most of them from that final deadline batch.

Because we now have such a good backlog of 8-bit applications, **Antic** will begin a new section next month—the Featured Practical Program. Starting in December, each issue will contain *at least* one type-in practical application for the 8-bit—if not more.

ABOUT THE WINNERS

The Grand Prize Winner was **Critical Path Project Manager** by David Schwener, which uses industry's CPM and Gantt Chart techniques of organizing workloads. Aside from being very useful for a wide range of personal and small-business activities, this software is written in an impressively clean and well-organized programming style.

Schwener, a product engineer from Fayetteville, North Carolina, is making his first appearance in **Antic**. His grand prize is an Atari 1040ST computer (courtesy of MichTron Software) and $500 of Batteries Included ST software from Electronic Arts.

The runner-up winners have all had other programs previously published here. Their prizes are one-year disk subscriptions to **Antic**. Each of these outstanding runner-up programs does only one job. But that job is handled very effectively and is useful to a large number of people. The runner-ups are:

- **WYSIWYG Cassette Jackets** by Chet Walters. Millions of music-lovers make personal copies—or compilations—of their favorite commercial albums and tapes. Now you can bring pleasing order to the chaos of your cassette collection and instantly know exactly what music you have placed on each cassette.
- **Bibliography Writer** by Alfred Filskov. All students in high school and college are going to have to turn out significant amounts of written term papers during their educational careers. Term papers usually require bibliographies of source material. But now your Atari can automate the maddeningly precise specialized punctuation your teachers want for bibliographies.
- **Your Best Route** by Jeffrey Summers, M.D. Whether you are traveling for business or pleasure, this software effortlessly figures out your least expensive route between multiple destinations.

SORRY FOR THE MIX-UP

A number of contestants wrote us that they were disappointed about getting the standard **Antic** rejection letter for their entries, without any specific written mention of the Practical Applications Contest. But we actually did *more* for entrants this time around. In previous contests, it was specified that all entries became the property of **Antic** and would not be returned or acknowledged.

However, we certainly apologize for upsetting anybody. It seems that the contest rules didn't make it clear enough that because all entries were being considered for publication in **Antic**—and all winners would get paid our regular publication rates along with their prizes—we were processing the contest entries exactly like regular magazine program submissions.

Nat Friedland

Nat Friedland
Editor, **Antic**

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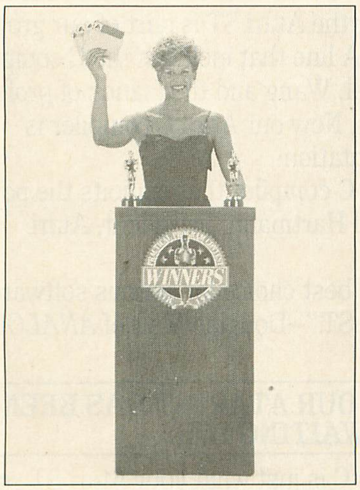
With its Super Disk Bonus, **Antic**'s disk edition is a real bargain at any price—especially at the new newsstand price of $9.95. I was especially pleased to find that the disk bonus, Antic Writer, provided a worthy competitor to my favorite word processor—also a relatively short, fast machine language program, but lacking the right-justification of Antic Writer. Now I have the best of both worlds. Thanks again for Antic Writer.

H.J. Woods
Reno, NV

PAPER GLITCH

Now that Electronic Arts has taken over Batteries Included, I hope they'll continue debugging the PaperClip word processor. One bug that has never been fixed is the block delete function, which does weird things if you use it more than once or twice. Version 2.0 for the 130XE has a dis-

continued on page 10



About The Cover: This issue features all four winners of **Antic**'s biggest programming competition yet—the 8-bit Practical Applications Contest. For more details about the contest results, see the editorial on the opposite page.

Super Disk Bonus

Galleons:

Arcade-quality sea battle

This month's Super Disk Bonus, Galleons, is a flashy, colorful two-player action game that runs on Atari 8-bit computers with at least 32K memory and disk drive. You control a sailing ship with your joystick and try to sink the enemy ship. Meanwhile, avoid those razor-sharp coral reefs—not all visible—which are all around you. Galleons is written in fast-moving assembly language using the OSS MAC/65 Macro Assembler.

SEA OF DOOM

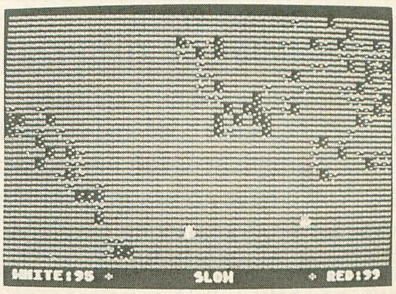
You sailed across the Atlantic Ocean, through weather both good and bad. The journey took months, but at last you are approaching your destination—the New World. On board, everyone is relaxing, when suddenly your lookout shouts, "Reef ahead!" Instantly all hands assume their posts, and within seconds your mighty galleon is turned away from the reef.

Surveying the immediate area, you realize you have now entered the coral reefs infesting the eastern end of the Caribbean Sea. But now things get even worse. "Ship ahoy!" the lookout cries. Then you see the dot on the horizon. As it comes closer, a chill grips your heart—it's the infamous Red Scourge, pirate terror of the Caribbean.

ABOUT THE PROGRAM

Antic editors really liked this speedy, professional-quality game as soon as we first saw it. Written entirely in MAC/65 assembly language, Galleons was a first submission to the magazine from Alan Capesius of Morton Grove, Illinois. A BASIC loader listing of Galleons would be necessary to make it useable for the majority of our readers, but this would have been too long for publication as a type-in.

Instructions for Galleons can be accessed from the Help Menu of this month's Antic Disk. Choose selection 5 on the Main Menu.

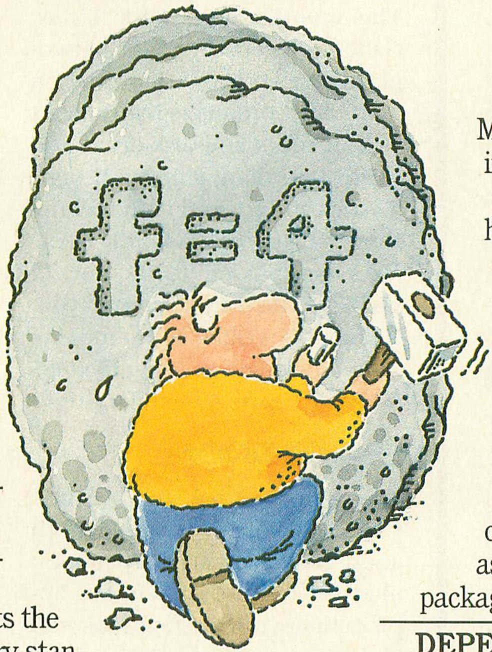


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The November, 1987 Antic Disk, featuring Galleons and the Practical Applications Contest Winners, will be shipped to you within 24 hours after your order—only $5.95 (plus $2 for shipping and handling) on your Visa or MasterCard. Just phone toll-free to **Antic**'s new in-house Order Service number, *(800) 234-7001*—Monday to Friday from 6 a.m. to 6 p.m., Pacific Time. Or mail a check for $5.95 (plus $2 shipping and handling) to **Antic**, 544 Second Street, San Francisco, CA 94107. ■

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*Sieve benchmark from Byte, 1983, done on one double-sided floppy disk and included RAM disk.

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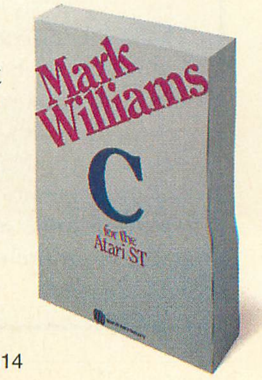
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continued from page 7

tressing new bug. Sometimes it produces strange characters when printing, or there's nothing in the buffer when I do a Print Preview.

I see that the August, 1987 issue of **Antic** had a letter recommending the Epson FX-80 printer driver for AtariWriter Plus and the Star NL-10. I've tried PaperClip's FX-80 with my NX-10, and it works fairly well except that it has emphasized print as a default. Also, the PaperClip symbol for right-justification of a line makes the printer type one line per page.

Sue Tempey
Mountain View, CA

***Antic** has had reasonable success with the Star SG-10 driver on the PaperClip disk, but we had to modify the file. Here's how: From the DOS menu, binary-load (Option L) PRTR.COM, the printer driver construction program. At the "Do you wish to modify an existing file" prompt, press [Y]. At the prompts, enter the control codes from your printer manual. You'll probably have to experiment a little before getting exactly the results you want.*—ANTIC ED

ONLINE.PRG

I can't tell you how pleased I am that your monthly programs are now available online. I thought that if you ever put programs on CompuServe, you'd charge a sign-up fee or a surcharge, but, thankfully, you've chosen not to. In the past, I've picked up a few copies of **Antic** a year, but with all the programs that will be available, I'm considering subscribing. In any case I'll be reading **Antic** much more frequently now that I can read about one of your type-in programs and download it easily. Thanks!

Logan Rothstein
CompuServe I.D.
72247,530

LIVES FOR HIS XE

Our son, Nicholas, age 9, lives for his Atari 130XE and has been programming since he was four. When he was in kindergarten a visiting computer teacher said Nick was programming at a sixth-grade level, and tests he took at Arizona State University while in first grade placed him above the 99th percentile for his age. Now he creates his own games and makes great animations and graphics. We're very proud of what he can do.

We probably should mention that Nick has albinism and is legally blind. Basically that means that he's light-sensitive and needs large print to read easily. But it's amazing how small the print can be when it's a computer program that he's reading. I know he'd be happy to get letters from other Atari users.

Cyndy Bensema
6525 N. 15th Avenue,
Phoenix, AZ 85015

PCS ADDRESS

Here are the address and phone number for PCS, featured in *Maverick Atari School* (**Antic**, October 1987): PCS School for Advanced Learning, Patrick McShane, Headmaster, 1020 W. Finch Drive, Nampa, ID 83651.

Help!

TAPELESS SPREADSHEETS

If you've been unable to get usable printouts from *Tapeless Spreadsheet Printer* (August, 1987), it may be that your dot-matrix printer cannot download special character sets.

Tapeless works by downloading a special "sideways" character set into your printer. If you're not sure whether your printer accepts downloaded characters, check your printer manual or phone the manufacturer.

The *Tapeless* article states that the program supports "four major printer families—Epson FX-80, Gemini 10X, Star SG-10 and Okidata 92." Printers such as these have their own RAM for holding installed or downloaded special character sets or fonts. After installation, the printer will use this special character set as long as the power remains on. For a detailed explanation of this process, see *Font Maker* (**Antic**, March 1985).

If your printer lets you use download characters, you should refer to your printer manual for the proper loading procedure. Next, select the *Tapeless* loading driver (Listing 6, 7, 8 or 9) which most closely matches the procedure needed for your own printer and make the necessary modifications. Please refer to the *Tapeless* article and listings for additional help. If you're unfamiliar with downloading characters into your printer, you should also read the *Font Maker* article mentioned above!

GHOST WRITER

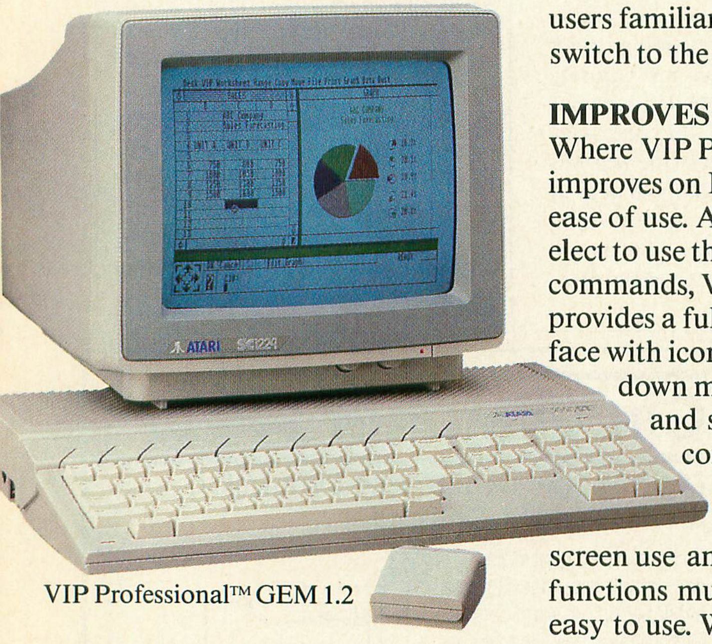
The vertical blank routine in *Ghost Writer* (July, 1987) may turn your screen black and freeze your keyboard when used with some of the older Atari 400 and 800 computers.

If you have this problem, simply add the line 1570 WAIT=0—and remember to SAVE the revised program before you RUN it. ■

***Antic** welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

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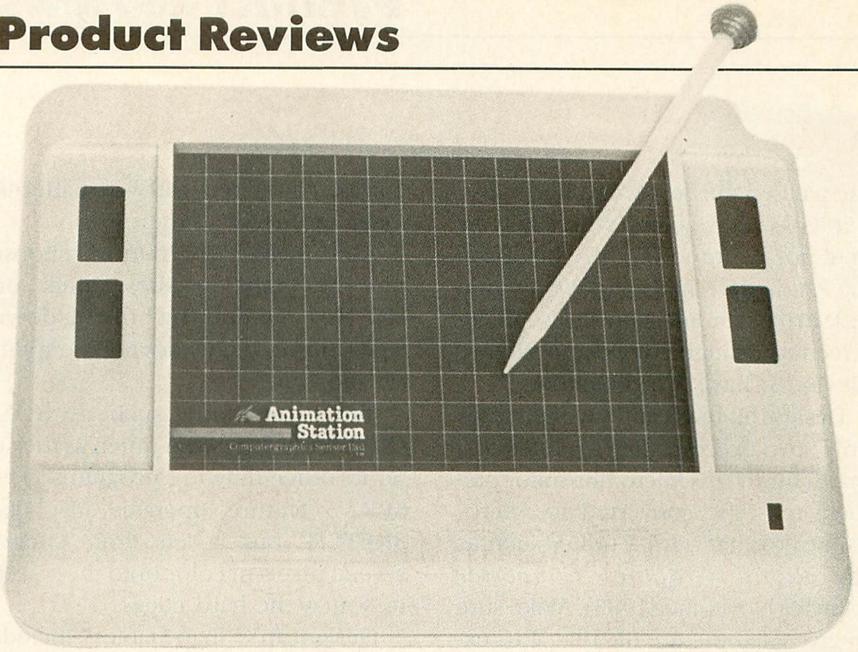


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CIRCLE **195** ON READER SERVICE CARD

Reviewed by Gregg Pearlman

A touch tablet emulates the precise finger control of pen/pencil/brush drawing much more accurately than a joystick or a mouse. And it keeps your hand in a more comfortable position than a light pen. These factors make a touch tablet the best tool for drawing computer pictures.

Unfortunately, KoalaPads for Atari and Atari's own touch tablets are no longer being made. For about two years, anybody wanting to find a touch tablet for an 8-bit Atari needed to search for hard-to-find remainder stockpiles.

But now the **Animation Station** is here to fill this graphics gap. Actually this powerful, versatile touch tablet from Suncom has been available for awhile, but the company never got around to announcing it to the Atari community.

The sturdy Animation Station plugs into joystick port 1. Its work surface is about the same size as the one on the Atari Touch Tablet—about 50% larger than the KoalaPad's. And it boasts two sets of DO and UNDO buttons, a great help to left-handed artists. The stylus stores away in a small hole at the upper right-hand corner, but it falls out easily and is not attached to the tablet.

A vital factor in the usefulness of any touch tablet is the graphics software that comes with it—as well as the other software it's compatible with. As we soon discovered, the Animation Station's **DesignLab** paint program is actually *Blazing Paddles* which earned a good review in **Antic**, January 1987. The only difference we could find is that DesignLab doesn't accept input from a joystick or light pen. (However, **Antic**'s copy of Blazing Paddles never worked with a light pen either.)

Like Blazing Paddles, DesignLab software works with the KoalaPad but not with the Atari Touch Tablet—up and down are reversed. However, KoalaPad's Micro Illustrator software will run on the Animation Station tablet.

As we said in our Blazing Paddles review, this software is comparable to

continued on next page

the well-established Micro Illustrator. But it has a few quirks, which may or may not be important to you. Blazing Paddles/DesignLab uses only one disk drive, you must go to a separate screen to change colors, and picture files *must* have .PIC extenders.

DesignLab loads and saves pictures only in 62-sector Micro-Painter format. This means Micro Illustrator pictures must be converted to Micro-Painter format with a utility such as the *Rapid Graphics Converter* (**Antic**, November 1985). Make sure to give each picture file that .PIC extender.

To get the feel of the program, you might want to "click" on SKETCH and start drawing free-hand. To change your four-color palette, click on COLOR. Select hues and luminances for your background and three playfield colors. The chosen colors, combined with six patterns, make up 96 Mix Patterns.

Now press a DO button, choose one of eight brushes, click on SKETCH and draw by holding down a DO button while moving the stylus on the tablet.

Other functions, such as BOX, OVAL and LINE(S) are much as they'd be in other drawing programs. The SPRAY feature operates just like SKETCH, but it lets you "spray" several pixels of color onto the screen to soften the hard edges.

DesignLab's "shape tables" include buildings, animals, weapons and cars. These can be flipped or rotated and placed in your picture. The three default text sizes are normal (like Graphics 0 uppercase), double-width ("Graphics 1," upper/lowercase) and double-width, double-height ("Graphics 2"). You can also add italic, bold or script character sets. But the manual doesn't suggest a way to add custom sets.

The ZOOM function is easy to use and, unlike the Magnify function in Micro Illustrator, you'll know exactly where you are in your picture. However, ZOOM only lets you place one pixel at a time—you can't FILL, SPRAY or even SKETCH.

The SCROLL feature lets you wrap the screen horizontally or vertically. In other words, you can center your picture, then save it—and it'll be centered when you reload it.

You can print your pictures on graphics-capable Epson printers, as well as Star/Gemini, Panasonic and Okidata Okimate printers. The 30-page manual has plenty of illustrations but skimps on some details. However, experimentation should tell you all you need to know.

Overall, the Animation Station graphics tablet with DesignLab software is a good package that makes a worthy replacement for the unavailable KoalaPad and Atari Touch Tablet. If you're looking for a touch tablet, you won't be disappointed in this one.

MONEY$PIN

(White Bag Software)
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CIRCLE **190** ON READER SERVICE CARD

Reviewed by Stephen Roquemore

Ordinarily, I'm no big fan of computer games. But this inexpensive little gem from White Bag Software is a welcome exception. It's challenging and holds my interest.

Money$pin is based on the popular TV game "Wheel of Fortune," but it uses a "one-armed bandit" as its motif instead of a carnival wheel. Up to four can play. There are two general categories and one each for history and sports, as well as a "hard" category—which *is* hard.

Each category has four subtopics: things, phrases, persons or titles. Select a consonant. If you guess correctly, the letter is displayed in the row of boxes—just like "Wheel of Fortune," only there's no Vanna White.

If you have enough money to buy vowels, buy E's first—they're the most common. The dollar amount is selected by the one-armed bandit instead of a wheel. You can keep buying vowels or spin again. If you think you know the answer, you can guess. However, you *should* go for as many letters as possible to build up your winnings—but it's very easy to blow it all on a bad spin. After four rounds are over, you can return to the menu, spin some more or load a new file and start again.

You can create your own data files or just use the ones provided. I recommend using the game disk's data files for a while before building your own.

You must use your own disks for creating data files, because the program only looks for certain filenames. If you put your new files on the game disk, you'll wipe out the original files. It's basically a straightforward process and the manual tells you what you need to know.

If you are looking for inexpensive, interesting software for your 8-bit Atari, I highly recommend Money$pin. ■

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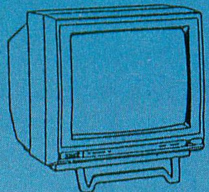
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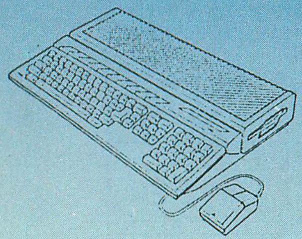
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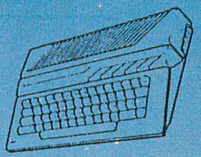
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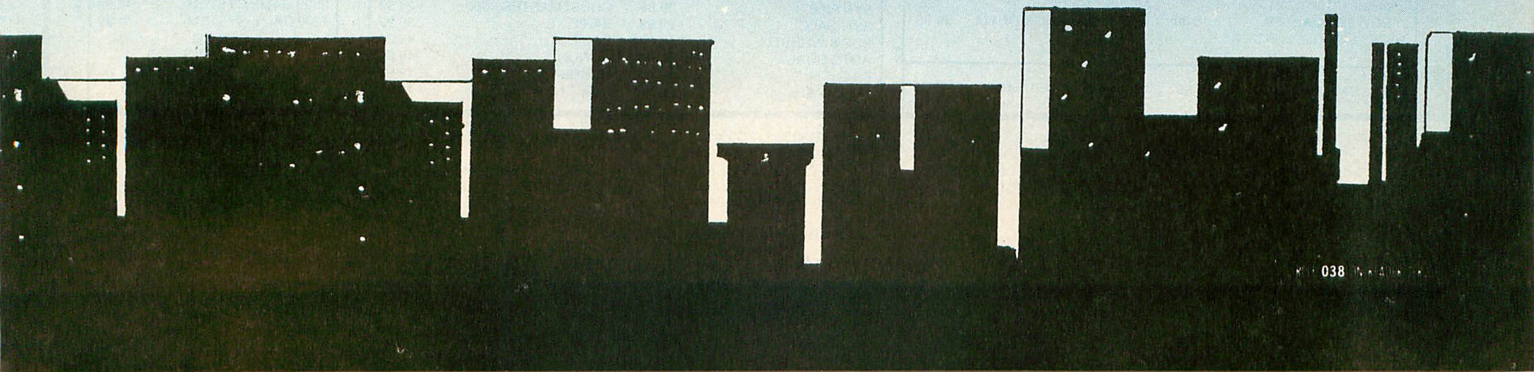
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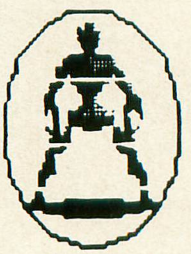
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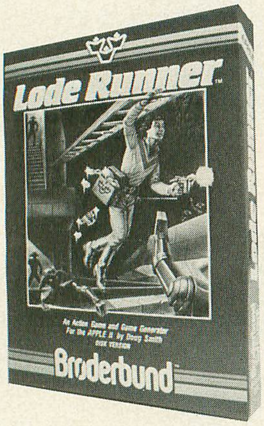
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STAR SOFT GAMES

(entertainment software)
TDC Distributors Inc.
3331 Bartlett Boulevard
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(305) 423-1987
$6.99-15.99, 48K disk
CIRCLE **198** ON READER SERVICE CARD

State-of-the-art graphics in vivid colors is the hallmark of Star Soft's new, inexpensive line of 8-bit games, including **Pirates of the Barbary Coast** and **Aliants** ($17.99 each), as well as **Sprong** and **Space Lobster** ($9.99 each) and **Disk 50**, a 50-game anthology for $6.99.



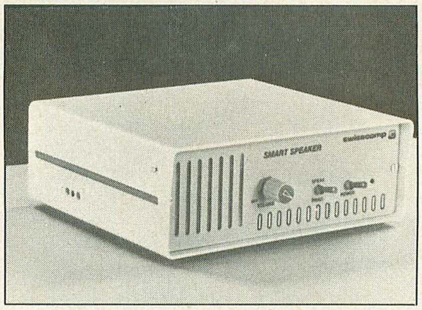
LODE RUNNER, KARETEKA

(entertainment software)
Broderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903-2021
(415) 492-3200
$14.95 each, 48K disk
CIRCLE **204** ON READER SERVICE CARD

The games aren't new, but the $14.95 price is. **Lode Runner** and **Karateka** are two of the many classic titles that Broderbund is discounting to between $14.95 and $29.95. These are the first titles available for the 8-bit Atari.

SMART SPEAKER

(speech synthesizer)
Swisscomp Inc.
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(813) 628-0906
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CIRCLE **200** ON READER SERVICE CARD



The **Smart Speaker**, a text-to-speech converter, connects to any computer having a standard parallel or serial port. It works with any software that puts out ASCII text to drive a printer. The Smart Speaker converts ASCII text to speech and speaks it out accurately through its built-in speaker. No special software is needed, and the program accepts data in formats that printers accept. The package includes a parallel cable ready to connect to your existing printer, and you can use the Smart Speaker to drive an external amplifier, VCR, audio tape recorder, phone answering machine, etc.

GUILD OF THIEVES

(graphic game)
Firebird
P.O. Box 49
Ramsey, NJ 07446
(201) 920-7527
$39.95, 48K disk
CIRCLE **197** ON READER SERVICE CARD

You're back in the mythical kingdom of Kerovnia in **The Guild of Thieves**, the long-awaited sequel to the ST hit **The Pawn**. This new 8-bit title combines witty dialogue, challenging puzzles and outstanding graphics. The package also contains a humorous 40-page novella, a Bank of Kerovnia credit card, an Indenture and Contract of Service certificate, dice, play guide and other goodies.

BORODINO: 1812

(strategy wargame)
KRENtek Software
5401 N. 10th, Suite 214
McAllen, TX 78504
(512) 682-9598
$59.95, 48K
CIRCLE **205** ON READER SERVICE CARD

The 70,000-casualty battle that inspired the "1812 Overture" and triggered Napoleon's downfall gets a worthy treatment in **Borodino: 1812**. Subtitled "Napoleon in Russia," this new title from the makers of a popular "Waterloo" wargame features eight scenarios, one or two player options, joystick control and variable speed action including real-time. The full three-day battle, with over 150 units, normally takes over four hours. Or you can just play the 15-minute "Assault on Shevardino" episode.

ACE OF ACES

(graphic game)
Accolade
20813 Stevens Creek Blvd.
Cupertino, CA 95014
(408) 446-5757
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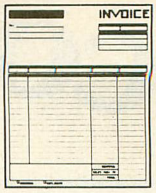
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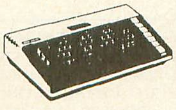
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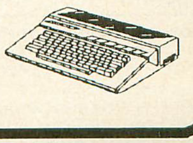
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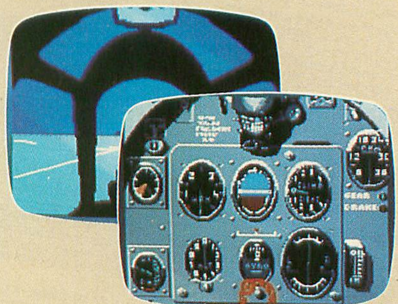
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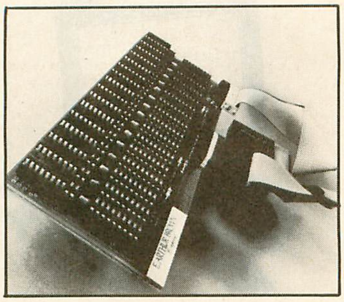
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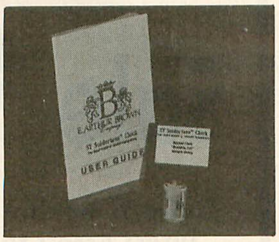
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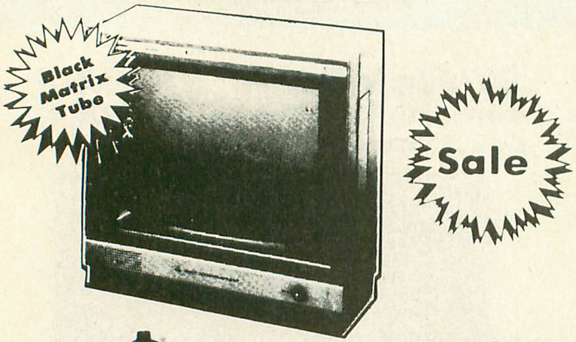
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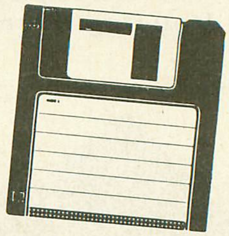
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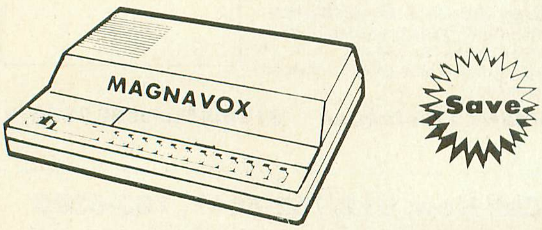
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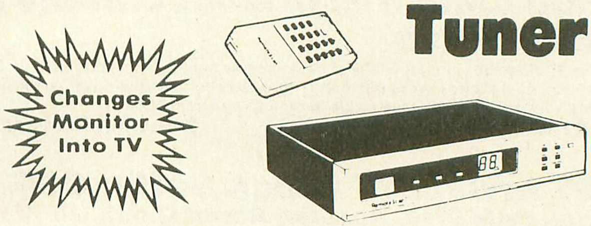
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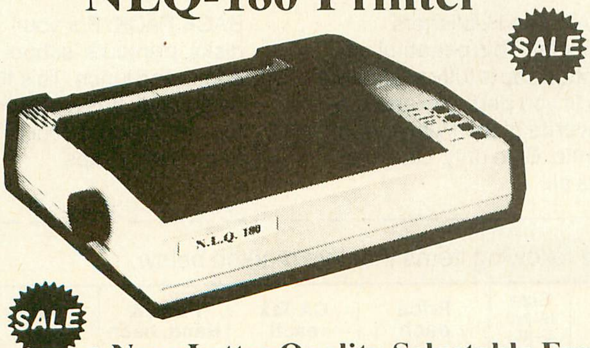
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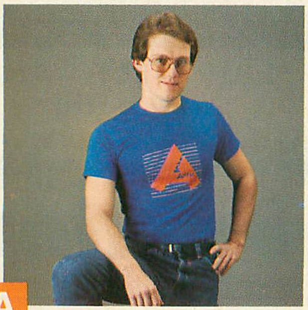
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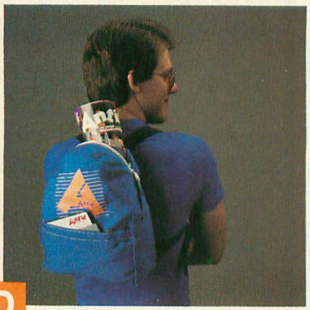
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By Heidi Brumbaugh, Antic Junior Editor

Hot and Cold

"Master Mind" challenge in 8-bit BASIC

Hot and Cold is an Atari 8-bit variation on the classic peg game recently revived as Master Mind. This compact BASIC program works on Atari 8-bit computers of any memory size, with disk or cassette.

Just about everybody has played Master Mind, or at least knows about this popular pegboard game of logical deduction. The game's concept is centuries old. It was played in old England as Cows and Bulls and more recently as Code-Breaker.

Antic published an ST version of Master Mind as *Deduction* in our December, 1986 issue. The October, 1983 **Antic** Game of the Month was Maxter Mind, which was written in assembly language. However, Hot and Cold is the first 8-bit Atari BASIC version of Master Mind ever published in **Antic**.

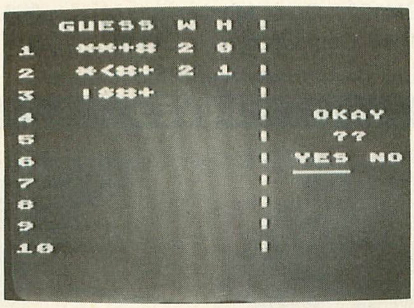
GETTING STARTED

Type in Listing 1, HOTCOLD.BAS, check it with TYPO II and SAVE a copy before you RUN it.

Hot and Cold is programmed in Graphics 1, a five-color mode. That's not really enough different colors handle the complete color-guessing puzzles of the traditional pegboard Master Mind game. So instead of colors, this time your Atari will challenge you with random arragements of symbols.

Which four of these six symbols—*, +, !, $, # and >—has the computer chosen? And in what order are these symbols placed? You must figure out the correct pattern of symbols in 10 turns or less. And a symbol can be used more than once in each pattern, which makes matters even more difficult.

Make your deduction by moving the joystick to highlight a symbol and then pressing the joystick button to select it. After your choice is displayed, the computer asks you to confirm it, which gives you an opportunity to change your mind.



After you select YES from the confirm menu at the right side of the screen, the computer will tell you how many symbols are "hot"—the correct symbol in the correct place—and how many are "warm"—the correct symbol in the wrong place.

This information appears in "W" and "H" columns at the right of your selected symbol patterns. Your remaining symbols are "cold"—so far off that they're not even displayed in a column. The trick is that the computer won't say *which* guesses are hot or warm. That's the part you must figure out logically.

For example, if the computer's pattern is + *!> and you guess + + *#, you'll have a 1 in the H (hot) column for the + and a 1 in the W (warm) column for the *. Notice that the cor-

continued on page 32

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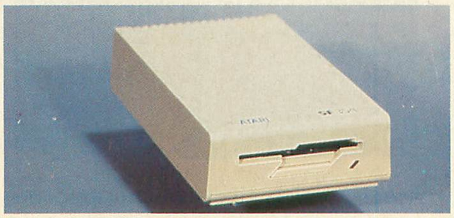


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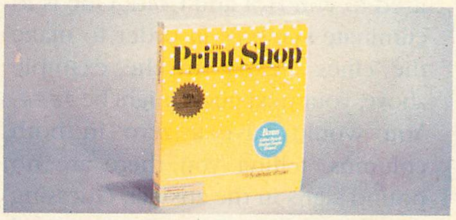


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HOT AND COLD
continued from page 29

rect + at the left is counted only in the H category and is not repeated under W.

Several different strategies can be used to win Hot and Cold. One is to eliminate symbols in order to make the clues clearer. In the example above, your next guess might be *####*. You would have a zero in both columns, telling you there are no pound signs in the answer. Guessing + + + + would tell you that one (and only one) of the plus signs in your first guess was correct—but you still couldn't be sure whether or not it was in the right place.

Another less scientific approach is to make a few random guesses so you will have lots of information to rely on. Your guesses remain on the screen throughout the game, so the real challenge of the game is to make new selections based on the hints given in previous turns.

If you don't guess the pattern in 10 turns, the computer will display the correct sequence and ask if you want to play again.

ABOUT THE PROGRAM

The code for Hot and Cold is short and straightforward. After initializing the program variables, the computer randomly selects its four symbols. It prints the game board, sets up the selection menu and then monitors the joystick to get the four symbols that make up the player's guess. If the player confirms the choices, the computer evaluates the sequence by checking each symbol in the correct sequence against each symbol in the player's guess.

Play continues until you figure out the sequence, or until all 10 turns are used up. ■

Heidi Brumbaugh wrote Red, White and Blue, ***Antic's** July, 1987 game of the month.*

Listing on page 75

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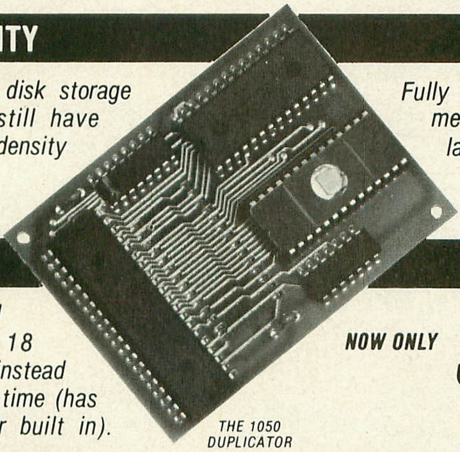
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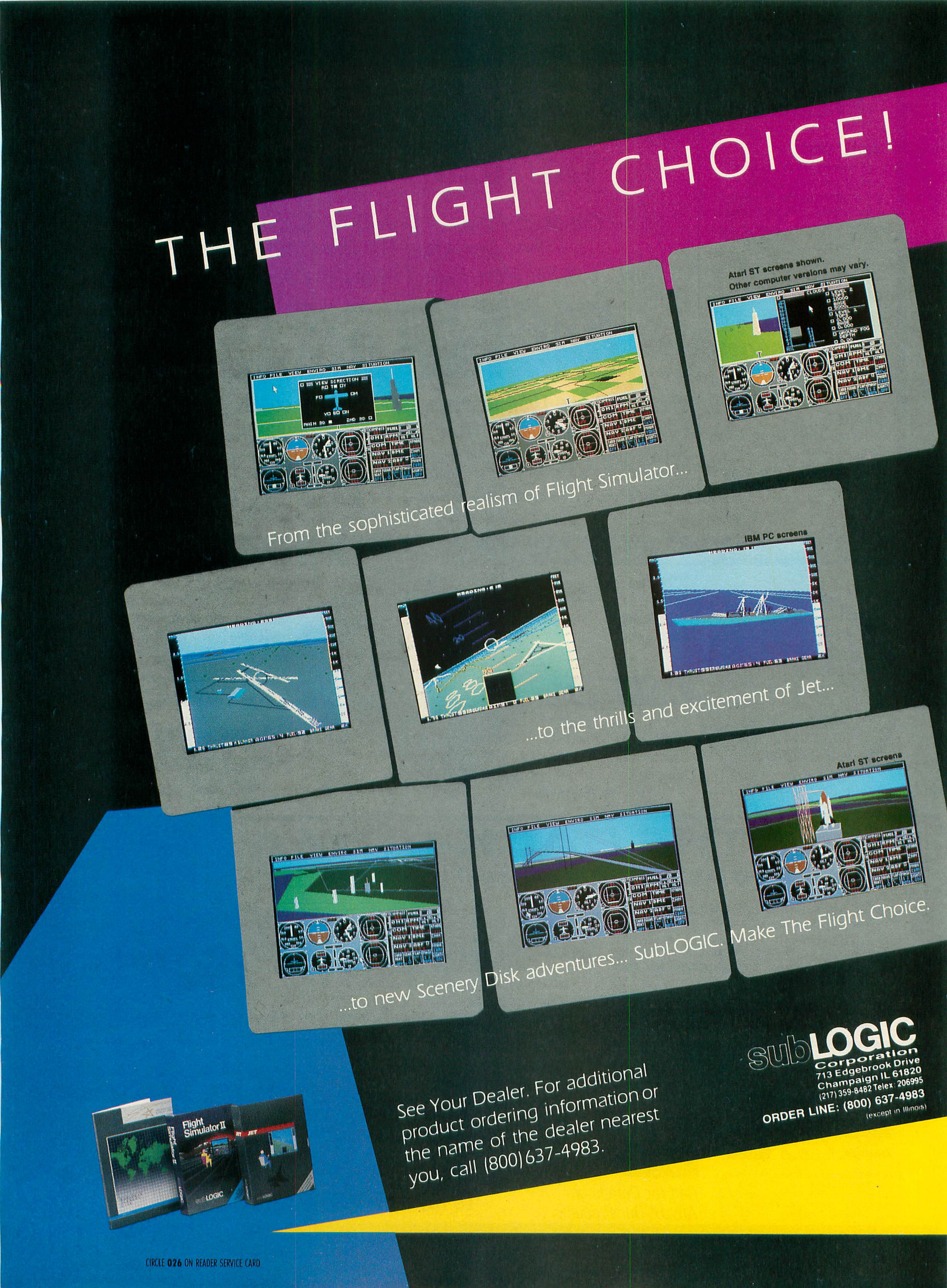
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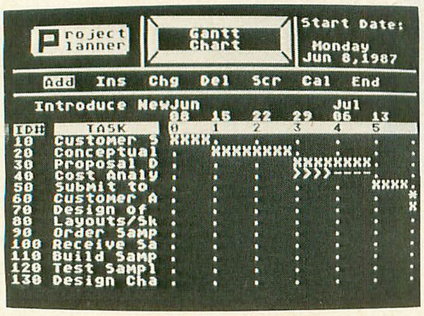
Use advanced business techniques to plan any of your own personal projects for greatest efficiency, prioritizing tasks and managing time most effectively. Critical Path Project Manager uses the breakthrough concepts developed for major corporations. And it displays or prints easy-to-understand work analysis charts that will help keep your project moving towards successful completion. This elegantly written BASIC program works with Atari 8-bit computers with at least 48K memory and a disk drive.

As far as I know, Critical Path Project Manager is the first professional task-scheduling program for Atari computers. With advanced professional-level evaluation techniques and a graphic display of project information, Project Planner helps manage even the most complex projects efficiently.

But even if you don't need Project Manager to help you run your own business or job, this software can be used for any activity, from club picnics to weddings to your next programming effort.

A project consists of several tasks that must be completed to meet the

continued on next page




```
Introduce New Product
                                 Jun             Jul
                                 08  15  22  29  06
ID#          TASK                0   1   2   3   4
---  ------------------------  -------------------
10   Customer Specification    XXXX.  .   .   .
20   Conceptual Design          .  XXXXXXXX.  .
30   Proposal Drawings          .   .   .  XXXXXXXX
40   Cost Analysis              .   .   .  >>>>----
50   Submit to Customer         .   .   .   .   .
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70   Design of Product          .   .   .   .   .
80   Layouts/Sketches           .   .   .   .   .
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110  Build Samples              .   .   .   .   .
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140  Send Sample to Customer    .   .   .   .   .
150  Customer Acceptance        .   .   .   .   .

LEGEND:    XXXX Critical Path      ---- Slack Time
           >>>> Non-Critical Path  * Milestone
```

final goal. Each task has its own name, length and relationship to the other tasks. The core of the Project Manager program is the Critical Path Method (CPM), which is widely used by large corporations to evaluate task relationships. Because some tasks cannot begin until others are done, a *path*, or series of related tasks, is formed.

The *critical path* of a project is the longest series of tasks which *must* be done on time to finish the project before the deadline. Other tasks are considered non-critical, since their start and finish can be delayed without affecting the final date. The maximum delay is called *slack time*. These tasks are then displayed on a "Gantt Chart," which shows both critical and non-critical tasks.

PLANNING A PROJECT

1. Define the *objective* and *start date* of the project.

2. List each task required to complete the objective.

3. List each task's *duration*. Also, decide if it must wait for other tasks to finish before it can start. A task that must be finished before another task can begin is called a *predecessor*.

4. Enter the data according to the following instructions, and view the Gantt chart. Look at the date of the final task to see when the project will be completed.

USING THE PROGRAM

Type in Listing 1, PROJPLNR.BAS, check it with TYPO II and SAVE a copy before you RUN it.

When you type a number or letter for menu selections, the characters do not appear onscreen and you don't have to press [RETURN]. However, when you type information for the program, these characters do appear onscreen and you must press [RETURN] to signal that you're done with a specific entry.

David Schwener, a product engineer from Fayetteville, North Carolina, divides his computer time evenly between programming and business applications. This is his first publication in **Antic**.

Pressing [ESCAPE] lets you exit, unless there's a specific menu selection for doing so. Also, if the border color is *not* black, or if there's a message indicating calculations in progress, user input is temporarily blocked.

MAIN MENU CHOICES

LOAD/SAVE A PROJECT: At the prompts, enter the drive number, then the filename with *no extender*. The directory only shows files with the .PRJ extender.

PROJECT INFORMATION: To select one of the following options, highlight it with the [LEFT ARROW] and [RIGHT ARROW], then press [RETURN].

PNAME: The Project Name can be 25 characters long and should adequately describe the project as a whole.

START: The start date (mm/dd/yy) of the first task of the project. Warning: the program will not check for the validity of a date (for example, 02/31/88), so be accurate.

SCALE: This refers to the unit length of one duration—hours, days, weeks, months, etc. Change the scale based on the project length.

WDAYS: Valid only in the Day scale, Workdays lets you exclude weekends and holidays.

GANTT CHART: Selecting this option without first loading a data file or entering a start date sends you to Project Information, where you must enter a start date before continuing.

ADD: Enter an identification (ID) number and press [RETURN]. IDs are like line numbers in BASIC programs: always increment them in steps of five or 10 to allow later additions. Entering an existing ID generates an error. The task is added to the schedule based on the ID. If you use an ID higher than any other task, the new task will be added as the *last* task in the schedule. If tasks 10 and 20 exist, adding task 15 will go in between them. When adding a task, no predecessors are changed automatically.

continued on page 42

WYSIWYG Cassette Jackets

Say goodbye to cassette chaos

by CHET WALTERS

If you're like a lot of other folks today, you probably make back-up cassette copies of your LP record albums, CD albums or commercial tapes. It's wonderfully convenient to have your favorite music on cassettes you can use in the car or with a portable cassette player. Not to mention the creative satisfaction of being your own disk jockey and making up original cassette programs that present the music in exactly the order you want.

As your collection of cassettes grows, sooner or later you'll find yourself facing the familiar problem of trying to write all the songs and artists on those cramped cardboard cassette jackets. If you're like me, you smear what you wrote for Side A while you're struggling to pen Side B, or you discover that you haven't got enough room for all the information you want to include.

WHIZZY-WIG

WYSIWYG (the desktop publishing acronym for "what you see is what you get") produces—in any typeface you desire—great-looking cassette jackets that you cut out and insert into your cassette cases instead of the cardboard jackets that come with blank tapes.

The program utilizes the bit-map graphics capabilities of Epson or C. Itoh Prowriter printers and their compatibles (Star, Gemini, Seikosha, etc.).

GETTING STARTED

Type in Listing 1, WYSIWYG.BAS, check it with TYPO II and SAVE a copy before you RUN it.

If you have trouble typing the special characters in lines 5000-5050, don't type them in. Listing 2 will create them for you. Type in Listing 2, check it with TYPO II and SAVE a copy. When RUN, Listing 2 creates these hard-to-type lines, and stores them in a disk file called D:LINES.LST.

To merge the two programs, LOAD "D:WYSIWYG.BAS" then ENTER "D:LINES.LST". Just remember to SAVE the completed program before you RUN it. You can then DELETE Listing 2 and LINES.LST from your disk to give you more room for font and jacket files.

PRINTER CHOICES

When you RUN the program, the first thing you're prompted to do is choose a printer. Since WYSIWYG's ultimate goal is a nice printout, we must be sure that the program works with your own printer. If you have an Epson-compatible (Star, Gemini, Seikosha, etc.) or a Prowriter-compatible, just press the corresponding number key.

WYSIWYG can also be made to work with almost any printer that has graphics capability. You simply add the necessary information to the printer list according to the instructions given in the REM statements that appear in lines 2042-2046 of Listing 1.

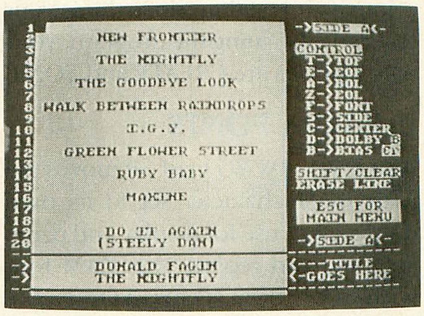
Since the program was designed around an Epson printer, the best results are obtained with printers capable of producing bit-mapped graphics at 120 DPI (dots per inch) horizontally and 72 DPI vertically. Since vertical resolution is standard on most printers (each pin is 1/72 inch apart) just enter the data that will set your printer to issue eight-dot line feeds. (That's 1/9 of an inch.)

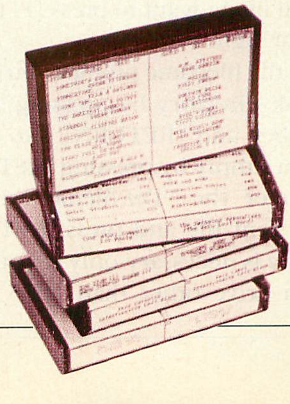
continued on next page

Chet Walters, the owner and general manager of Non-Standard Magic, is the author of Words are Fun *(Antic Disk Bonus, May 1987) and Lister Plus/Picture Plus ($19.95, The Catalog, APO179).*

PRACTICAL PROGRAM CONTEST WINNER ANTIC 1987

Print neat, readable jacket directories for all your audio cassettes in any typeface you like. WYSIWYG Cassette Jackets is a BASIC program that works on 8-bit Atari computers with at least 32K memory and a disk drive. The program should work with most graphics-capable dot matrix printers.





For horizontal resolution, set your printer for 120 DPI (or 960 dots per 8-inch line—sometimes called high-resolution graphics) and tell it to expect 480 dots. What we're after is a jacket that is four inches wide and 4 1/8 inches long to match the cardboard jackets of standard cassette cases. If your printer cannot produce exactly 120 DPI, set it to print at the nearest resolution *greater* than 120 DPI and clip your jackets a little wide so that they're eight inches from side to side.

Now tell WYSIWYG whether the most significant bit (MSB) or least significant bit (LSB) will "fire" the TOP-WIRE of your printer. The last number in your printer's DATA statement must be this value—either 1 or 128—and it must appear as a *negative* number to signify that WYSIWYG should stop reading DATA and move on. If your printouts have the text upside down, you've entered the wrong value here.

MAIN MENU

From the main menu you can CREATE a new jacket, EDIT, SAVE, or PRINT a jacket currently in memory. The [E], [S] and [P] keys won't work unless there is a jacket in memory. You can also LOAD a jacket previously saved; or load a custom FONT for printing and editing. Since this is your first time RUNning the program, your only options are CREATE and FONT.

CUSTOM FONTS

When WYSIWYG loads, it moves the Atari ROM character set to its own RAM area to use for display and printing. You can replace this RAM font with any nine-sector FONT file created with a font editor such as Envision ($19.95, The Catalog, AP0185). If you have a disk full of these fonts, you'll likely want to press [F] to load a font right now.

At the filename prompt you can get a disk directory by pressing a drive number and [RETURN]. Go to the menu simply by pressing [RETURN], or enter the "D*n*:filename.ext" of your font file and press [RETURN]. (The *n* is necessary only if you're using a drive other than D1:.) If you choose the latter, your font file will load and be shown.

Caution: you *must* load a legitimate font file. WYSIWYG gets its personality by using the character set in its RAM area for display as well as printing. If you inadvertantly load a file that turns the display to garbage, press [CONTROL] [.] while at the main menu to reinstall the Atari ROM set into RAM. Then reload the correct font file. But be warned: [CONTROL] [.] will wipe any custom font you've loaded, so don't use this key wantonly.

CREATE AND EDIT

Since you have no jacket file as yet, press [C] for CREATE. WYSIWYG will wipe the jacket form clean and turn you over to the editor. What you see now is an accurate representation of Side A, or the *left* side of your cassette jacket. To the right of that is a mini-menu displaying the editing features available and which side of the jacket you're editing.

Jacket lines 1-20 represent what will show through the clear plastic of the cassette case, where most of your songs will be listed. At the bottom, between two heavy lines, is the title area, which you see at the narrow end of the cassette case once the jacket is clipped and folded. Press [CONTROL] [E] to go to the bottom of the form and you'll see jacket lines 21-27, which appear on the back of the cassette case.

Side A now has a form 27 lines long by 25 characters wide to hold your song list, plus two lines for the title. Press [CONTROL] [S] to see a matching form for Side B, which goes on the *right* side of your jacket. [CONTROL] [S] flips between the two.

Since [CONTROL] keys are reserved for the commands illustrated at the right, only standard ASCII characters (numbers, uppercase or lowercase letters and punctuation symbols) can be used as text. [CONTROL] [C] centers the text on the line in which the cursor appears, and then it moves the cursor to the next line. If there are any leading spaces, the text will not center properly. However, text can be blocked right by "centering" it repeatedly.

[CONTROL] [F] switches the display font between your custom font and the Atari ROM font, but will harm neither of them. If you haven't loaded a custom font, [CONTROL] [F] won't work. [CONTROL] [D] toggles your Dolby noise reduction selection through None, B, C or Hxp. [CONTROL] [B] toggles the Bias—NOrmal, CrO2 or MeTal. These can be set individually for each side and they appear nicely formatted at the top of your printed jacket.

All of the normal features of the Atari screen editor are supported by the WYSIWYG editor, except that [SHIFT] [CLEAR] erases only one line. To clear an entire side, press [CONTROL] [T] to get to the Top Of Form (TOF), then hold down [SHIFT] while alternately pressing [CLEAR] and [RETURN] until you're satisfied.

[CONTROL] [INSERT] and [CONTROL] [DELETE] work normally, but only on the line in which the cursor appears. [SHIFT] [INSERT]ing a line scrolls the last line off the end of the form. Any text pushed off of the form with these editing keys will be lost and gone forever. [SHIFT] [INSERT] and [SHIFT] [DELETE] will not work when the cursor is between the two title lines.

Type your song titles and side titles in the appropriate places on each side of the form, and then press [ESCAPE] to exit to the main menu. Once there, pressing [E] returns you to the editor on the side you came from.

LOADING AND SAVING JACKETS

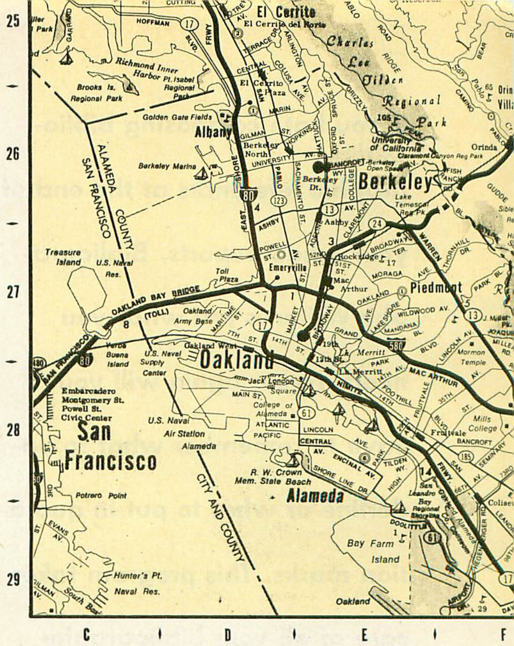
When loading or saving a jacket, enter the filename, but *do not* include an extender on your filename. WYSIWYG appends .JKT to SAVEd filenames, thus denoting them as jacket files, and looks for this extender when loading jackets. Only .JKT files can be loaded, and if you try to load a file that is not legitimate, WYSIWYG returns to the menu while retaining the pristine quality of the current jacket in memory. Jacket files are 21 sectors long, so you can fit several on a disk. The program can't delete jacket

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Your Best Route

Trip planner saves $$$

by JEFFREY SUMMERS, M.D.



John and Mary Smith of Honolulu are planning a trip to the mainland. They want to see the Grand Canyon, Yellowstone National Park, the Grand Tetons, the Air Force Academy, San Francisco and Disneyland. Flights could land them near any of these locations, and then they will rent a car that charges by mileage. Where should they land and what route should they take to minimize expenses?

ABC Delivery Service has a regular route involving 10 stores and businesses around town. There is a morning pickup, then the parcels are sorted, and an afternoon delivery is planned for those customers that have packages. With gasoline prices increasing again, they want their drivers to use the shortest possible routes—which may change daily as different businesses receive packages from the service.

J.Q. Publique, with his Official Airline Guide confidently in hand, figures he can get anywhere in the country in a day, but he has trouble figuring out the least expensive route when he has to go to five different cities in five days, the order of which doesn't matter.

Your Best Route effortlessly solves a wide range of route-planning problems. Type in Listing 1, TRAVEL.BAS, check it with TYPO II and SAVE a copy before you RUN it.

When you first RUN the program, use option [1] to create a new table/map. In the following example, we'll make up a small table using only four locations. Up to 20 locations are allowed. Antic Disk Owners will find a larger map file covering major cities in the Western U.S., WEST.MAP, on this month's disk.

MAKE A TABLE

Each location name can have only eight characters, so type Buffalo, Cleve, Pitts and Columbus.

Now you'll see the first three columns of your table. The cursor is in the upper right-hand corner, almost like a spreadsheet. The locations appear along the side of the table and across the top. Move around the grid with the [ARROW] keys, filling in distances as you go. Once you start in a direction, you can either press [RETURN] to continue in that direction or another [ARROW] key to change direction. The table shows three columns at a time.

Now move to the first row (Buffalo), second column (Cleveland) and start entering distances until your table looks like this:

	Buffalo	Cleve	Pitts	Columbus
Buffalo	0	240	300	360
Cleve	240	0	240	120
Pitts	300	240	0	150
Columbus	360	120	150	0

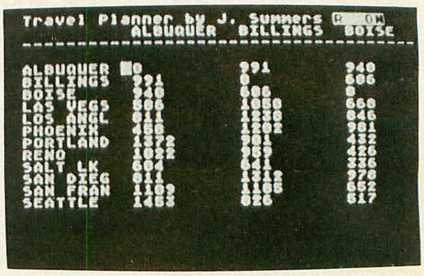
The R ON in inverse video at the upper right-hand corner of the screen means that the "reciprocal" function is on. Entries for distances in one direction are entered automatically into the opposite direction. Naturally, the distance between Buffalo and Cleveland is the same as the distance between Cleveland and Buffalo. Press [R] to turn off the reciprocal function. You can toggle this as much as you like while entering or editing a table.

After you're satisfied with the table, press [E] or [ESCAPE] to go back to the main menu. Now save the table with option [2]. Use the format D:FILENAME.EXT. Here, enter

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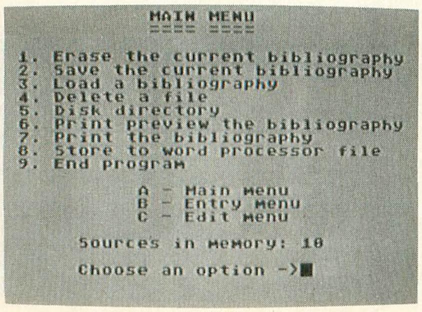
Jeffrey Summers is a practicing internist in Rochester, NY. He teaches a BASIC class for the ACORN users group. Dr. Summers is the author of Decide *(**Antic**, June 1986).*

Your Best Route helps you cut down travel expenses by finding the shortest distance among a cluster of destinations. This BASIC program works on Atari 8-bit computers with minimum 48K memory and disk drive.



If you hate composing bibliographic references at the end of your school reports, Bibliography Writer is just what you need. Never again will you have to remember what to underline or what to put in quotation marks. This program takes care of all your bibliography punctuation and spacing. It even alphabetizes your source list when you're done. The program works with Atari 8-bit computers of any memory size, disk or cassette. It can be adjusted to work with just about any printer.





Bibliography Master

Automate your term papers

by ALFRED FILSKOV III

Throughout your school career, you'll have to write numerous reports and term papers. Virtually all of these essays require a bibliography that lists your sources of information. Assembling a bibliography is a monotonous grind at best, forcing you to either memorize or continuously look up a series of arbitrary stylistic rules. But your Atari doesn't get bored by monotonous, rule-bound work. Just give it the right software commands and it'll crunch out whatever job you tell it to do.

With Bibliography Writer, now you just type the basic information for each source in your bibliography and the correct formatting is all done automatically. Source categories accepted by the program are books, encyclopedias, magazines, newspapers and interviews. Additional types of sources can be processed with the Compose Your Own option. After you complete your bibliography you can alphabetize it, save it, print out a paper copy, or even store it as an ASCII disk file for merging with the word processor file of your actual report.

The printing routines in Bibliography Writer are designed to work with Epson printers and compatibles such as Star and Gemini. But if you don't own an Epson-compatible printer, there are REM statements within the program that you should be able to use for creating any printer driver you need.

The codes to start and cancel underlining are defined in line 90 as [ESCAPE] [1] and [ESCAPE] [0]. If the codes for your printer are different, replace US$ and UC$ with the correct codes. Also, to set the left and right margins, edit the values of LM and RM in line 550.

GETTING STARTED

Beat those bibliography blues! Type in Listing 1, BIBWRITE.BAS, check it with TYPO II and SAVE a copy before you RUN it.

When you RUN Bibliography Writer, you'll see the Main Menu. To enter your sources, go to the Entry Menu by pressing [B]. Here you'll choose the category of source you want to enter—and the program asks you for all the information it needs. When you are through entering the information, you will be returned to the Entry Menu. If you need to enter a source that is not on the Entry Menu, you can choose option [6] to compose your own new format.

After entering all your sources, you can alphabetize your list by first pressing [C] to go to the Edit Menu and then selecting option [3]. To print-preview your bibliography onscreen, press [A] to return to the Main Menu and then choose option [6]. If you see an incorrect source, you'll need to remember its number and go to the Edit Menu by pressing [C]. Then, choose [2] to delete the source and type the number of the incorrect source followed by a [RETURN]. You then must return to the Entry Menu and re-enter the source.

After your bibliography is correct, save it by pressing [2] on the Main Menu. Then you can print it out by choosing option [7]. Before the program prints your bibliography, it will ask you if you want to send your printer any special control codes, such as instructions to use the near letter quality character set. If you don't wish to send any special codes,

continued on page 44

Alfred Filskov is the author of Appointment Calendar *(Antic, January 1986) and* V-Graph *(November 1986).*

ANOTHER DULL DAY?

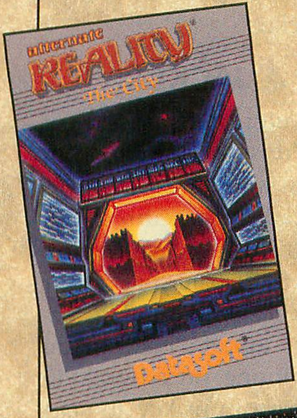
You could dust the bowling trophies, groom the dog, clean the gardening tools, go for a walk, floss, thaw some fish sticks, pay a few bills, or . . .

You could be thrust headlong into the most chilling and deadly of worlds—Alternate Reality.®

After being kidnapped by an alien spaceship, you stalk the streets of The City of Xebec's Demise, boldly wielding everything from Battle Hammers to Magical Flameswords. Become an awesome Warrior, mighty in strength and wealth, able to meet all challenges, preparing for the fateful day you enter The Dungeon.

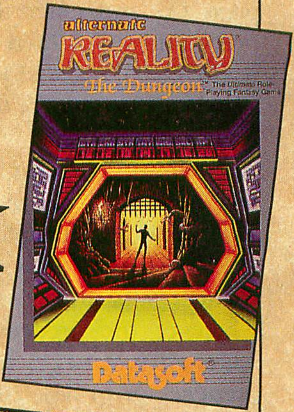
Descend into the gloomy depths of The Dungeon, where Trolls, Ghouls, Dragons, and Devourers all vie to make you into a quick and crunchy snack! Where crossing a gorgeous Valkyrie could mean a grisly demise. Where you must conquer quest after life-threatening quest. Where you can choose to become good or evil!

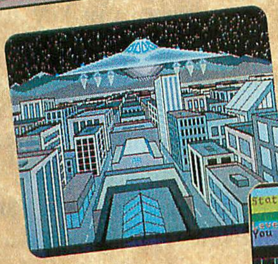
. . . or make some tapioca, open a letter marked "occupant," floss (again), arrange your sock drawer . . .

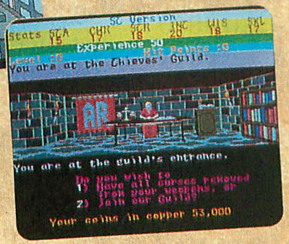


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CRITICAL-PATH
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After entering an ID, press [N] to name the task. If the task must start on a specific date, press [S] and enter the "time line" number underneath the corresponding date. The time line number is in inverse video and is merely a reference number for that date.

Press [D] to enter the task's duration, which should relate to the scale selected. For example, if using the "week" scale, a task that takes 14 days should be entered as having a duration of 2. If you want to represent an *event* rather than a *task*, leave the duration at 0. Tasks with no duration are called "milestones" and are shown as asterisks on the Gantt chart.

If this task cannot start until other tasks are complete, press [P] for predecessors. Up to five predecessors (A-E) can be entered. To enter the first, press [A] and enter the ID of the preceding task. When all the predecessors have been added, press [RETURN]. When you're done, press [F] for finished.

INS: Insert is similar to Add, except that *predecessors are shifted automatically.* For example, if you insert task 15 between tasks 10 and 20, the predecessors for 15 will become whatever the predecessors for 20 were. Also, task 15 is added as a predecessor of task 20.

CHG: To change a task, you must enter an existing ID or else you'll get an error message. The CALC option may be required in order to see the change reflected on the Gantt Chart.

DEL: Again, an existing ID must be entered. The task information is displayed along with "Delete this task (Y/N)?". Pressing [Y] deletes the task. Pressing anything else will abort.

SCR: This option lets you view various parts of the Gantt Chart. Pressing [H] displays the upper left-hand corner of the schedule, beginning with the first task at the project start date. Pressing [L]eft, [R]ight, [U]p or [D]own lets you enter how far you want to move in that direction. The move is based on the time scale. If you press [5] and the scale is days, you will move five days in the direction selected.

CAL: To allow faster data entry, calculation of the critical path is not automatic. If on the last line of the display the word CALC appears, the chart might not be pictorially correct. To view the correct Gantt Chart, select this option to calculate and display the new critical path.

REPORT WRITING: The Gantt Chart can be printed either in normal or condensed print (if your printer supports it). Place your printer's control codes for condensed print in line 4000.

PROGRAM TAKE-APART

Lines 20-310 calculate the critical path.

Lines 320-350 move screen 1 to screen 2 and lines 360-380 move screen 2 to screen 1.

Lines 390-410 are the GET key routine. Lines 420-480 get an alphanumeric string, lines 490-550 get a numeric string.

Lines 560-680 convert the standard date to Julian or vice versa.

Lines 690-760 draw a generic window. Lines 770-980 generate the main menu. Lines 990-1620 are the Load/Save Data routine.

Lines 1630-2320 are the Project Information routine. Lines 2330-3660 are the Gantt Chart routine Lines 3670-4100 are the Report Writing routine. Lines 4110-4230 calculate calendar information. Lines 4240-4820 print the Gantt Chart to the screen or printer.

Lines 4830-5260 contain the initialization routine and lines 5270-5290 display errors.

PROGRAMMING NOTES

Windows are achieved through the machine language routine MOVE, which moves the entire Graphics 0 screen from one address to another. When a window is needed, the screen is first copied to another location. Then the window is printed to the screen using standard POSITION and PRINT statements, replacing the text "underneath" it. When the window is removed, the copied screen is moved back to the display area and the text is restored intact.

Another interesting technique occurs in line 4520. I wanted to fill a string with a pattern of characters. By slightly modifying the method of filling a string with a single character, I was able to fill MASK$ with a pattern of periods and spaces in a single line.■

Listing on page 65

WYSIWYG
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files though, so you must do this through DOS.

Note: If you have a jacket in memory, even if it's blank, you must press [Y] at the WIPE CURRENT FORM prompt before you can LOAD or CREATE a new jacket.

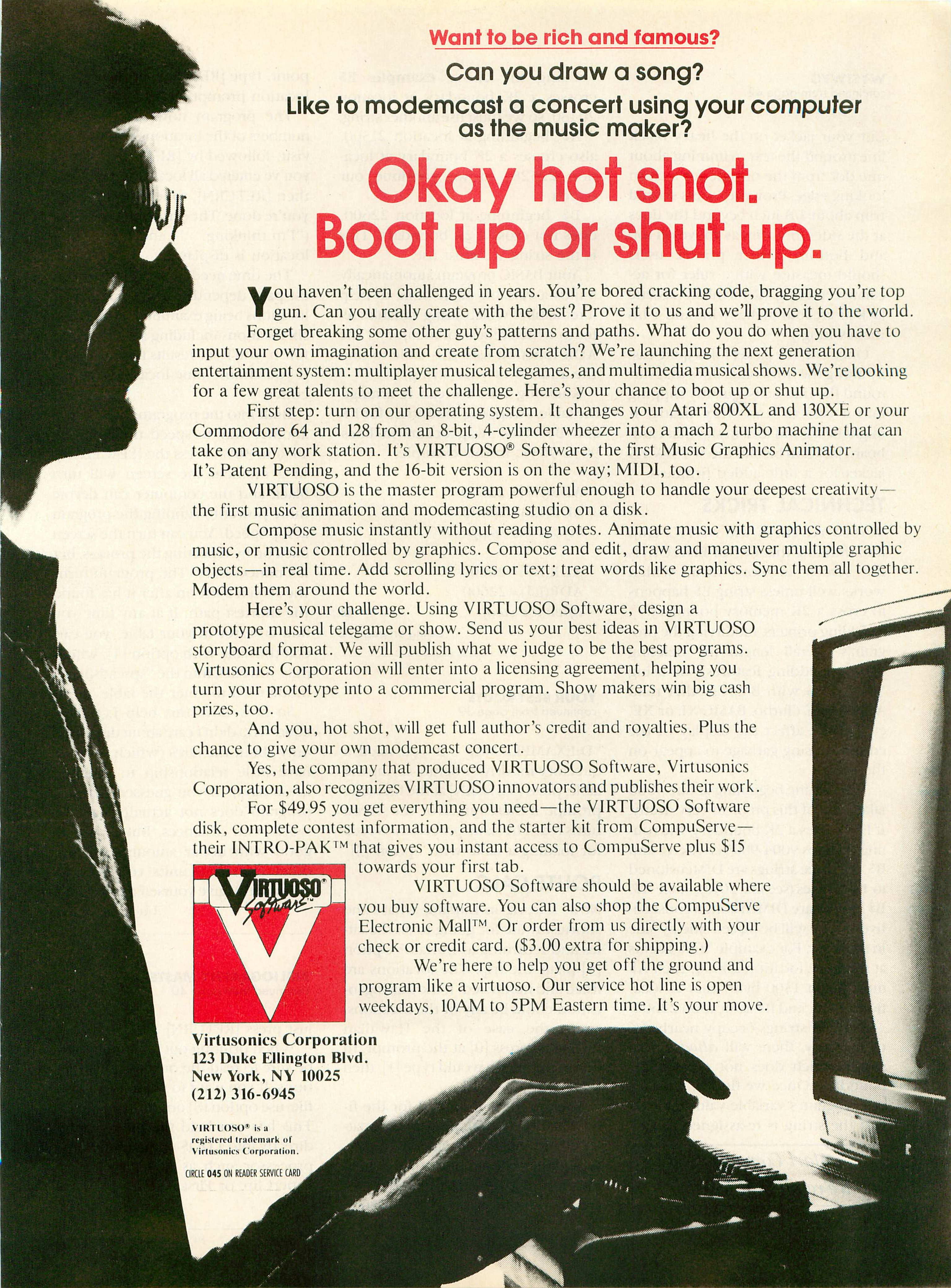
PRINTING A JACKET

Ahh. . . the ultimate purpose of WYSIWYG. Press [P] to print, and press [N] if you want to use the Atari ROM set instead of the current displayed font. (Pressing [N] won't harm your custom set.) Prepare your printer by making sure it's online and the paper is set to the top of a page. If you wish to stop printing, press [ESCAPE] at any time. Press any key to start again.

Your jacket is printed on the left side of the page, and two jackets will fit on a page. The printer starts printing exactly where your paper is set, but after printing a jacket, WYSIWYG issues one line feed, so you need not adjust your printer after printing only one. After the second jacket on a page, however, press the Form Feed button on your printer to move the paper to the top of the next page, or else the next jacket will print across the perforation.

Once you've printed your jackets, cut them with scissors, a paper cutter or, if you're like me, with a razor knife, straight-edge and cork board.

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Want to be rich and famous?

Can you draw a song? Like to modemcast a concert using your computer as the music maker?

Okay hot shot. Boot up or shut up.

You haven't been challenged in years. You're bored cracking code, bragging you're top gun. Can you really create with the best? Prove it to us and we'll prove it to the world. Forget breaking some other guy's patterns and paths. What do you do when you have to input your own imagination and create from scratch? We're launching the next generation entertainment system: multiplayer musical telegames, and multimedia musical shows. We're looking for a few great talents to meet the challenge. Here's your chance to boot up or shut up.

First step: turn on our operating system. It changes your Atari 800XL and 130XE or your Commodore 64 and 128 from an 8-bit, 4-cylinder wheezer into a mach 2 turbo machine that can take on any work station. It's VIRTUOSO® Software, the first Music Graphics Animator. It's Patent Pending, and the 16-bit version is on the way; MIDI, too.

VIRTUOSO is the master program powerful enough to handle your deepest creativity—the first music animation and modemcasting studio on a disk.

Compose music instantly without reading notes. Animate music with graphics controlled by music, or music controlled by graphics. Compose and edit, draw and maneuver multiple graphic objects—in real time. Add scrolling lyrics or text; treat words like graphics. Sync them all together. Modem them around the world.

Here's your challenge. Using VIRTUOSO Software, design a prototype musical telegame or show. Send us your best ideas in VIRTUOSO storyboard format. We will publish what we judge to be the best programs. Virtusonics Corporation will enter into a licensing agreement, helping you turn your prototype into a commercial program. Show makers win big cash prizes, too.

And you, hot shot, will get full author's credit and royalties. Plus the chance to give your own modemcast concert.

Yes, the company that produced VIRTUOSO Software, Virtusonics Corporation, also recognizes VIRTUOSO innovators and publishes their work.

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VIRTUOSO Software should be available where you buy software. You can also shop the CompuServe Electronic Mall™. Or order from us directly with your check or credit card. ($3.00 extra for shipping.)

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WYSIWYG
continued from page 42

Cut your jacket on the heavy black line around the text, trimming about one dot from the outside for a clean looking edge. Prowriter users should trim about 1/8-inch beyond the lines at the sides, but trim as above on top and bottom. Other printer users should measure with a ruler for accurate centering. (Remember, Cassette Jackets are four inches wide and 4 1/8 inches long.)

Once cut, the jacket folds quite easily along the horizontal lines that surround the title, subsequently slipping into a cassette case very neatly. It might be a good idea to slip that cardboard jacket in behind the WYSIWYG jacket for a little added firmness.

TECHNICAL TRICKS

WYSIWYG tricks the ANTIC chip into thinking that E$ (for EDITOR) is the screen memory area, which works well unless string E$ happens to cross a 2K memory boundary.

Adding printers, modifying the program's overall length (by deleting REMs or adding features), or using WYSIWYG with BASICs other than Atari BASIC (Turbo, BASIC XL or XE, etc.) could affect the display of the editor, causing garbage to appear on the screen.

The routine beginning at line 9000 takes care of this problem very neatly. If E$ crosses a 2K boundary, the routines in lines 9004-9005 check A$ and B$. All three strings are DIMensioned to 1300 bytes (see line 2010). Since A$, B$ and E$ are DIMensioned consecutively, they will be placed side-by-side in memory. For example, if E$ begins at memory location 20000, then A$ must begin 1300 bytes later at location 21300, and B$ at location 22600.

As these strings occupy nearly 4K of memory, there will *always* be a string which does not cross a 2K boundary. Once we find it, we alter the program's variable value table so that the string is re-assigned to E$.

Using the above example, E$ crosses a 2K boundary at location 20480, so we must use another string.

A$, beginning at location 21300, also crosses a 2K boundary at location 22528, so we continue our search.

B$, beginning at location 22600, does not cross a 2K boundary. This is the string we must use.

Your BASIC program automatically builds a variable value table to help it remember which string variables refer to which blocks of memory. (The ADR function uses this table to find the address of your string).

Knowing this, we can re-arrange the table, swapping the entries for E$ and B$. This swap occurs in lines 9032-9034. In this example:

ADR(B$)=22600
ADR(E$)=20000
before the swap

ADR(B$)=20000
ADR(E$)=22600
after the swap ■

Listing on page 70

YOUR BEST ROUTE
continued from page 39

"D:EXAMPLE.MAP". If you need a directory for drive 1 before saving the table, press [RETURN] at the filename prompt. If there's an error, the screen turns red. The same procedure is used for loading a table with option [3].

ROUTE CALC

Now, starting in Buffalo, what's the shortest route for going to all the cities and returning to Buffalo? Option [5] plans the trip. The locations are listed and numbered. If the starting location could be any of the locations, as in the case of the Hawaiian travellers, press [0] at the prompt. In our example, we would type [1], then [RETURN].

You are then prompted for the final location. Again, if it doesn't matter where you end up, enter [0]; otherwise, enter the number of the final location. If you want the ending location to be the same as the starting point, type [RETURN] at the ending location prompt.

The program now asks for the numbers of the locations you want to visit, followed by [RETURN]. When you've entered all locations, press [0], then [RETURN], to tell the program you're done. The screen turns yellow ("I'm thinking. . .") and the starting location is displayed.

The time needed to find the shortest path depends on the number of locations being examined. If you have six locations including a set start and finish, you'll see results fairly quickly. If you choose nine locations, go for coffee.

Built into the program, however, is another way to speed things up by 15% to 30%. Press the [SPACEBAR]. In a moment the screen will turn black and the computer can devote more power to running the program at top speed. You can turn the screen back on by repeating the process, but it's unnecessary. The program turns the screen back on after it has found the shortest path. If at any time you find an error in your table, you can edit the table with option [4], which puts you back into the "spreadsheet" mode used to enter the table.

So how does this help J.Q. Publique, who didn't care about distances, only about the fares (which seem to have little relationship to distance these days)? If you guessed that the program does not actually have to work with distances, but is just as good with dollar amounts (or any other numerical units you need to work with), give yourself a gold star. ■

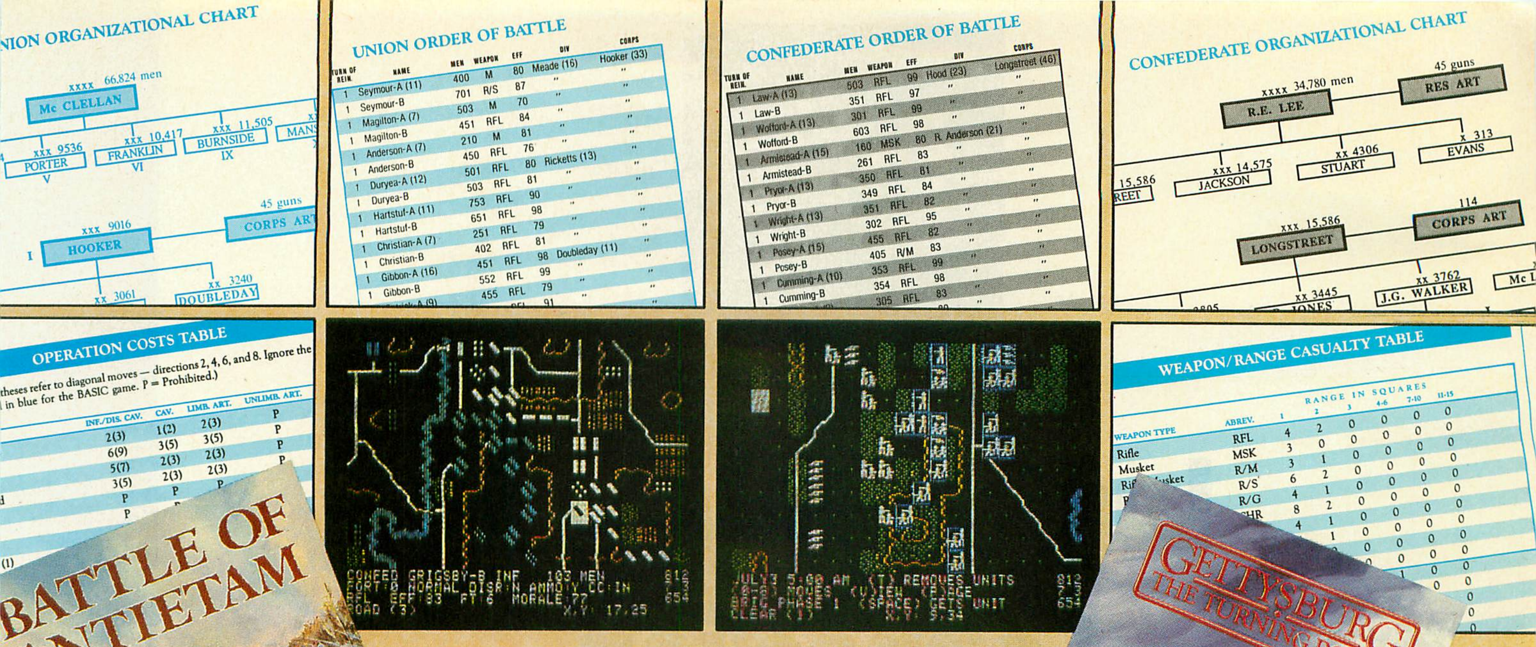
Listing on page 76

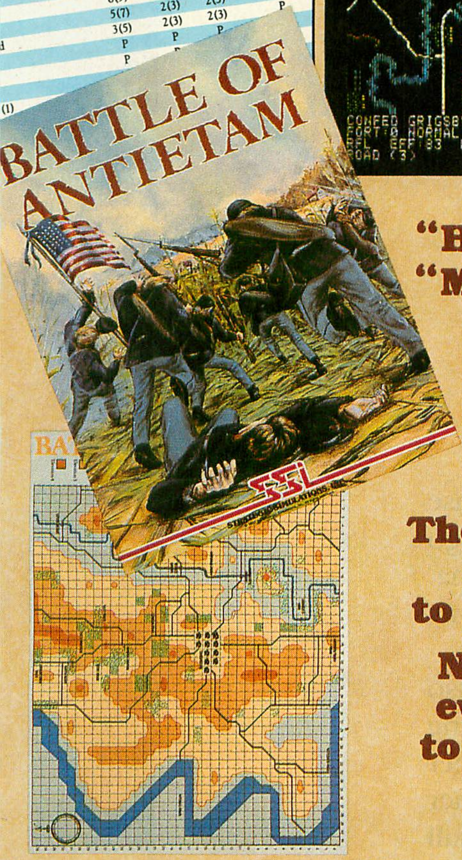
BIBLIOGRAPHY MASTER
continued from page 40

just press [RETURN].

When printing out a bibliography, be sure to read the onscreen instructions. If you want to print it to a disk file, use option [8] on the Main Menu. This lets you load the bibliography directly into a DOS-compatible word processor such as AtariWriter Plus, PaperClip, or First XLEnt. ■

Listing on page 72







"HIGHLY RECOMMENDED"
"MORE THAN FIRST RATE"
"EXCELLENT GAME"
"REVOLUTIONARY"
"A TRUE CLASSIC"
"A MUST"

These were some of the words magazine critics used to praise Battle of Antietam™.

Now, they're going to need even stronger superlatives to describe our new game — GETTYSBURG: The Turning Point™.

After the long months of hard work it took to create *Battle of Antietam*, we knew we had a very special winner on our hands. We're happy to see that the gaming public feels the same way:

"Battle of Antietam... *marks a long awaited return by (SSI) to the Civil War. Let's just say it was worth the wait... Inside (the package) you'll find ...one of the most complete manuals to be found in computer gaming. And we do mean complete!...SSI and the authors have created more than a first rate grand tactical simulation.... They have captured some of the look and 'feel' of Civil War combat, and it shows.*"
— Computer Gaming World, April 1986

"Battle of Antietam *is a must for anyone with even a mild interest in the Civil War. The simulation is easier to understand than many others of its kind... it's more than just another game.*"
— COMPUTE!'s Gazette, June 1986

"*Like all SSI games,* Battle of Antietam *has been meticulously researched and is a tactical game on a grand scale... SSI has produced dozens of computer war games, gathering praise from many sources.* Battle of Antietam, *however, may transcend previous efforts and become a true classic.*"
— COMPUTE! June 1986

"Battle of Antietam *is highly recommended... highly absorbing and a superb presentation of one of the most historic battles of the Civil War.*"
— Computing Today! May 1986

Needless to say, we're pleased by this flood of compliments. But at SSI, we're our own harshest critics, which is one reason SSI continues to be the acknowledged leader in computer wargaming. We immediately set out to create another Civil War game that further raises the standard for strategy simulations. The proud result is *GETTYSBURG: The Turning Point.*

Advertisers have been accused of stretching their imagination to come up with incredible superlatives. Get ready to stretch yours after you've picked up a copy of these two games from your local computer/software or game store.

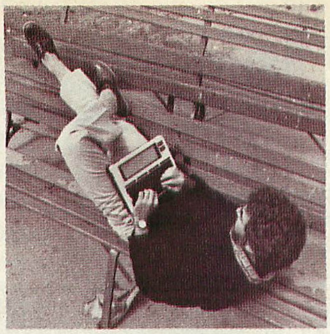
If there are no convenient stores near you, VISA & M/C card holders can order *Battle of Antietam* ($49.95) and *Gettysburg: The Turning Point* ($59.95) directly by calling **toll-free 800-443-0100, x335.** To order by mail, send your check to: **STRATEGIC SIMULATIONS, INC.**, 1046 N. Rengstorff Ave., Mountain View, CA 94043. (California residents, add 7% sales tax.) Please specify computer format and add $2.00 for shipping and handling.

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SSI



The

Laptop-to-Atari Connection

Handy file transfer to your 8-bit or ST

by CHARLES CHERRY

I love my Atari computers. And I love them most because they have changed forever the way I write. I could never go back to banging out draft after draft on my old Smith-Corona. Last year I formally acknowledged this fact when I gave away the typewriter to the Salvation Army.

But now that I am hooked on word processing, I am also hooked *to* the computer. Gone are the days of disappearing into a redwood grove to finish a report in solitude. No longer the romantic fantasy of being an author dressed in summer whites, sitting in a wicker chair on the lawn with a small typewriter on my knees.

Then I began to think, who needs a small typewriter. . .? I can get an inexpensive small computer! So that's what I did. I found a first-generation laptop computer being closed out for less than $200. It's a member of the Radio Shack Model 100/NEC 8201A family.

This type of computer is not very powerful, but it supports a delightfully flexible writing environment. It's small enough to keep in the car, take to the library, or curl up with in an overstuffed chair. You can even bring a low-cost laptop to your favorite coffee house and write poetry on a full-size keyboard instead of paper napkins and old envelopes.

So my writing life became a lot sweeter—but it was still not perfect. My laptop's text editor is pretty primitive. It doesn't even have search and replace. And there's no printer

continued on page 48

photography by TIA DODGE



Models: David & Carly Rush



support at all, just an ASCII file dump. So if this laptop isn't a full-fledged word processing computer, what is it? Well, to me it's the perfect peripheral for any Atari—a portable terminal for either an 8-bit or an ST. (*ANTIC ONLINE has used a Radio Shack 100 since 1985 to transmit live reports from computer shows.*—ANTIC ED)

My laptop is a very convenient tool for getting my first draft into digital form—sort of a memory dump for the brain. I go someplace that inspires me to work creatively and write a rough draft. Then I zap the text over to the Atari, where I rewrite, edit and generally massage it into shape. This works great for me, because rewriting takes the concentration and focus that my office can provide.

Zapping the text file to your Atari is easy. Almost all laptop computers have some kind of telecommunications capability and most of them (even the lower-priced models) have a built-in modem. This provides several possible ways to accomplish the file transfer—depending on which Atari computer you own.

8-BIT CONSIDERATIONS

There are a few extra factors you must keep in mind when uploading laptop files to an Atari 8-bit computer. That's because 8-bits don't have a built-in RS-232 port like the STs.

If you have a modem that plugs directly into your 8-bit, such as the Atari 1030 or XM301, you can use it with your laptop's built-in modem. But you'll be restricted to the speed of your slowest modem—probably 300 baud. Get a short cable with a modular telephone plug at each end. Connect the cable to your modem and to the modem jack on the laptop. Now you can follow the overall directions in the next section.

If you don't own a modem that plugs directly into your 8-bit, you'll need an interface module with an RS-232 adaptor, such as ICD's P:R: Connection or the Atari 850, before you can proceed to the instructions below.

There is one more adjustment 8-bit owners must make. These Ataris use a non-standard code for the carriage return and line feed (155 instead of 13 and 10). Your software adjusts to this with a parameter called Translation. Set your Translation for ASCII (sometimes called Light Translation) and the returns will be fixed automatically.

NULL MODEM

To transfer files between a laptop computer and your Atari, you need a suitable cable, some telecommunications software and either a modem or a "null modem."

Null modem connectors are two-way plugs that generally cost less than $10. These devices switch the wires controlling data flow, which makes two computers think they're talking to modems instead of to each other. Several different wiring patterns qualify as RS-232 null modems. But if you have a choice, get the simplest null modem that'll do the job for your system. You can also get cables wired as null modems. These work just as well, but you can't also use them with real modems. (*For more information about null modem connectors, see* ST File Transfers with Kermit ***Antic**, August 1985, page 25.*—ANTIC ED)

My ST and my laptop both have standard DB-25 sockets, so I can use a null modem connector with a normal modem cable. Other laptops might need custom cables. Any Atari telecommunications software should work. Most laptops already have adequate file transfer programs built-in.

LAPTOP TO ATARI

Get started by connecting your portable to your Atari via modem cable and a null modem (or real modem). Turn on the telecommunications software of both computers. Now you'll need to set the software for both machines to the following:

8-bit word length
1 stop bit, no parity
Half duplex
XON/XOFF enabled
Highest baud rate for
both computers

(The highest baud rate both computers can handle is generally 9600 or 19200 baud, although some software may be limited to 2400 or even 300 baud.)

If one computer won't accept some of these parameters, set the other one as shown above and pray for luck. If you're unlucky, work your way through all the possibilities until you hit on one that succeeds. You'll know you got it right when something typed on either keyboard shows up unscrambled on both screens. Make sure the carriage returns come through correctly too.

If your modem software supports macros, save your successful configuration for future use. Otherwise, just write it down and keep the note handy.

Now set your Atari to receive a simple text file. Most programs call this CAPTURE or RECEIVE ASCII, but there are other variations. You do *not* want XMODEM, KERMIT, or any of the other protocols. Give your Atari a filename to save the text. Now the Atari will wait to receive the data.

Tell the laptop to send the file. The computers will handle the rest, so sit back and watch the text scroll across the Atari screen. When the file transfer is complete, be sure to save the file to disk before you continue..

All this sounds like a lot of work, but it's really easy and takes less time to do than to describe. The entire process will become automatic by time you complete your second or third file.

My laptop computer is the best purchase I've made since I got my original 8-bit Atari. It has made the hard work of writing so much more pleasant. For example, ths article was written on a sunny Saturday afternoon while watching the radio-controlled sailboats glide across Spreckels Lake in San Francisco's Golden Gate Park. ■

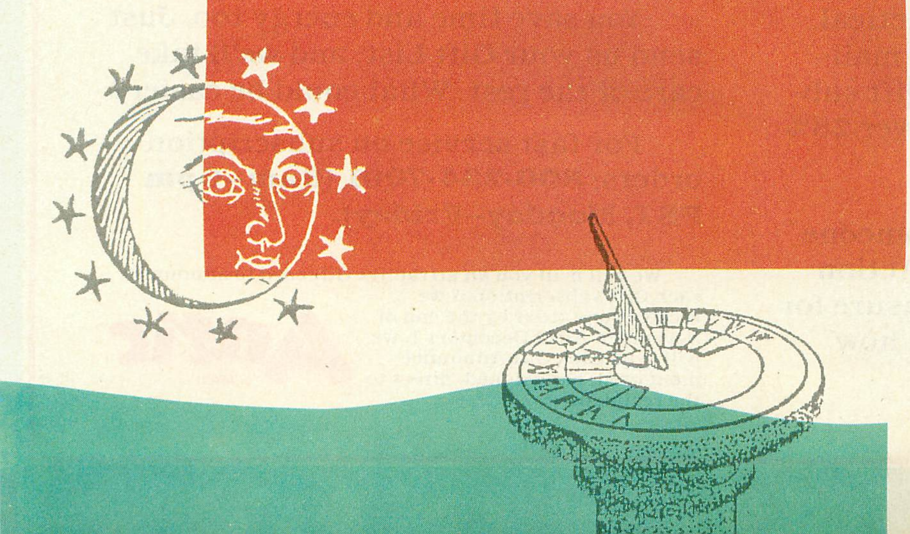
Charles Cherry, former product manager for The Catalog, has written many reviews for this magazine and is the 8-bit editor of the ABACUS users group newsletter in San Francisco.

THE ST RESOURCE

ANTIC NOVEMBER 1987



TAP THE POWER OF YOUR SYSTEM CLOCK



CONTENTS

ST Disk Subscribers: For instructions on how to transfer **Antic** ST programs to 3½-inch disk, see ST Help File on Side B of monthly disk. ST programs from previous issues are available in 3½-inch format from The Catalog.

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Antic
The ATARI Resource

ST Product News

ST Reviews

ALTERNATE REALITY: THE CITY (Version 2.0)

Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311-9969
(818) 886-5922
$44.95
CIRCLE 265 ON READER SERVICE CARD

Reviewed by Jim Pierson-Perry

Alternate Reality is here at last for the ST! Originally previewed in the November, 1984 **Antic**, this is planned to be a seven-part series of interrelated role-playing fantasy adventure games. Each adventure will be a separate scenario with its own quests and puzzles but will tie into the overall plotline. Sort of like the old Saturday matinee cliff-hangers, isn't it?

The City is the first installment of the series and must be completed to go on to the succeeding disks. It is a training ground where you develop your alter ego character's personality, abilities, and equipment as well as learning basic survival skills.

You begin the game by creating your player character, who will continue throughout the series. There are six character traits which you can pick: stamina, charm, strength, intelligence, wisdom, and skill. Load up on strength at the start, since your bare hands will be your only weapons. Your initial finances and hit points (measure of survivability) are also set at this time. As your character gains experience, these trait levels will increase and allow you more playing options as well as improve your combat skills.

The playing area is modeled after an enclosed city with over 4000 locations. Hidden behind its labyrinthine walls and secret passages are shops, inns, taverns, smithies, and banks. Here you can purchase equipment, get a job or invest in savings accounts. Hidden away more deeply are the various guilds where you can increase your character trait levels and be trained in the arts of magic. Mapping the city is vital to unravelling its secrets and a starting map guide is included in the game documentation. Be sure to purchase a compass early on in the game or you will quickly become hopelessly lost. In your travels you will find locations that you cannot enter without a future scenario disk (entrances to the dungeon, palace, arena, etc). Mark them well on your map—they will be important as the series progresses!

You will not be alone in your travels, since the city is heavily populated with both honest citizens and those who prefer to prey on the weak (e.g. you). Even worse are the nonhuman horrors who stalk the streets after dark, so beware the night until you gain some defenses! Unless you really want to be a nasty soul, do not pick fights with commoners or merchants—the city guards will take an unfavorable viewpoint towards your continued existence!

When you encounter someone (or something) you have several options including attack, retreat, and cast a spell. Effective fighting requires different tactics for different foes. Fighting occurs in real-time so keep a finger near the pause key if it gets too intense.

Be prepared to die quickly and often until you get used to the game. Stay close to the town center and do not go out at night until you get a weapon (a dagger is good to start with). After you gain some experience and have over 25 hit points, you can try some exploring.

Alternate Reality's point-of-view graphics are outstanding. You see your surroundings from eye level in a realistic, detailed 3-D perspective that scrolls very smoothly with your movements. The realism even includes sunrise, sunset, and weather changes. There is a strong time dependency to the game and many play options can only occur during certain times. Simple movement can be done by mouse, joystick, and/or keyboard controls. However, some options (e.g. leaving a store) only work with the joystick or keyboard.

I do have a complaint: the game

continued on next page

save is the worst I've ever seen! When you save the game, you also are thrown out of the program and left to hang. It doesn't even return to the GEM desktop. Even more insidious, however, a given game save can be used only one time and is then erased. This lovely effect is not covered in the documentation and caused me to waste the benefits of several hours of game play. Adding insult to injury, the game save file apparently cannot be backed up by normal GEM functions; however, a simple sector copier will do the trick nicely.

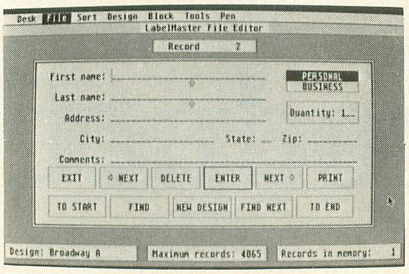
Alternate Reality: The City is potentially an exciting addition to the ranks of ST gaming. By itself, The City is not so much a game as a playing shell; there is no purpose besides simply wandering around, killing things, mapping, and building up your character in preparation for quests yet to come. The success of the series remains with the disks yet to come (the next one, The Dungeon, is not slated for release until the end of 1987). However, a hint book should be available by the time you read this review.

LABELMASTER
Migraph, Inc.
720 333rd Street
Federal Way, WA 98003
(206) 838-4677
$39.95

Reviewed by David Plotkin

LabelMaster (LM) is a combination address book database and label printer. It has the unique feature of printing labels with graphic pictures. It comes with over 100 pictures, has a built-in graphics editor for making your own pictures, and is compatible with PrintMaster files, meaning that there is a large library of ready-made graphics ready for use.

The first portion of LM is the database. Each record consists of fields for First Name, Last Name, Address, City,



State and ZIP. There is no phone number field. You fill in the information by typing it in the dialog box for each record. A variety of buttons also appear in the dialog box. You may print the record, delete it, move to another record, move to the first or last record, find the next occurrence of a specified string, or choose a new graphic design for the file. Two other boxes let you specify how many of this particular label will be printed, and to choose the personal or business format. Personal format prints the first and last name on the first line of the label, while the business format prints the first name on the first line and the last name on the second line. Thus, you can put the person's whole name in the first name field, and their company name in the last name field.

LM has many options once you have designed some records. You may print all the specified records as business or personal. You can sort the records on any field. You can also customize the text of a special label to be wide, normal, or condensed for each line individually. You cannot, however, print out already defined records using this special definition, but must fill in the information on the screen —and you cannot save this information.

The other half of LM is the graphics. Each label you print out can have a graphic icon, or small picture, printed on the left side. This can really dress up your labels, especially when you are sending out Christmas cards. When you print out a whole file of labels at once, they will all have the same graphic icon printed on each one. However, when you print out single labels, you can choose which graphic design will be on each label. If you decide to load a design, you will be presented with a file selector box to choose the name of the graphics file you want to load. Each graphics file contains a number of icons. After you have loaded the file, a page of titles for the graphic icons in the file will be put on the screen. You may choose one of the titles by clicking on it or move to the next page or previous page of titles. Clicking on a title will load it and it will then be available for editing. This procedure is also how you load a design when you select "change design" in the database portion of the program. The design will appear magnified on the screen, and you can now change it. You select a pen color (black, white, or checkerboard) and click in the squares you want to color. You can also flip the design either horizontally or vertically, and invert it (white becomes black, black becomes white). You can move the design one line in any direction, print it, erase it, and either copy or move a user-defined block. Further, there are two modes for block operations, Replace (covers what was there before) and Transparent (moves or copies only the black dots from the original area to the new area, so the original design shows through). You may also draw lines of either one- or three-pixel width. When you are done with your design you give it a name and can save it with the file.

LabelMaster is a very simple program, but it does what it is supposed to do very well. The graphics editor could benefit from a few more tools (like a circle), and the database could use a phone number field, so that you could use the database as your address book, and not just for making labels. But all in all, this program is easy to use and fulfills a function I have yet to see anywhere else. If you enjoy making creative mailing labels, I recommend this program to you. ■

ST New Products

By Gregg Pearlman, Antic Assistant Editor

M/CADD

M/CADD is the first system to offer a complete, integrated solution from 3-D preliminary design through 2-D detail drawings. The program consists of two user-configurable packages, JIL-Comp and JIL-Mod, and lets you do 3-D wireframe modeling as well as 2-D drafting. JIL-Comp and JIL-Mod are linked through an associative database that lets you make the 3-D changes and have them reflected in 2-D.

$299.95, monochrome. Migraph, 720 South 333rd Street, Suite 201, Federal Way, WA 98003. (206) 838-4677. PRESS

CIRCLE **243** ON READER SERVICE CARD

THE LAST WORD?

Fully GEM-compatible, **1ST Word Plus** has pull-down menus and up to four concurrent text windows, as well as a 500-words-per-second spelling checker with a 40,000-word dictionary—and you can spell-check as you type. The new version of 1st Word also has a full-function mail merge system, WYSIWYG onscreen print styles, centered and left- and right-justified text, sophisticated search-and-replace functions, multi-column output and a footnote facility. You can also do block cut-and-pastes, either within a single document or from one window to another.

$99.50. Electronic Distribution, 8 Green Street, Willingham, Cambridgeshire CB4 5JA, England. 011-44-954-61258. FINAL.

CIRCLE **240** ON READER SERVICE CARD

GOTHIC ZORK?

Infocom's **Plundered Hearts** could be an interactive gothic romance novel for your ST.Coming to life will be your wildest fantasies (within reason, of course) as you set sail for the West Indies on a 17th century schooner so you can take care of your ailing father. Romance and danger: it's all yours.

$39.95. Infocom, Inc., 125 CambridgePark Drive, Cambridge, MA 02140. (617) 492-6000. PRESS.

CIRCLE **254** ON READER SERVICE CARD

PROJECT PROGRESS

LOGiSTiK Senior ($149.95) and **LOGiSTiK Junior** ($99.95) integrate project management and database functions into a spreadsheet environment. LOGiSTiK Senior uses presentation-quality graphics, but both versions let you compute the critical path of a project, specify scheduling constraints, and produce Gantt charts, resource histograms and project calendars. You can perform "What-If" and logical operations easily and get a true, colorful picture of your project's progress—in time units ranging from half-hours to years. The 1024 x 2048 spreadsheet reads files from most ST database packages. LOGiSTiK Senior's graphics program produces more than 20 graph types.

Progressive Peripherals & Software, Inc., 464 Kalamath Street, Denver, CO 80204. (303) 825-4144. FINAL.

CIRCLE **241,243** ON READER SERVICE CARD

continued on next page

CIRCLE **011** ON READER SERVICE CARD

CIRCLE **053** ON READER SERVICE CARD

TEST DRIVE

Experience the feel of driving several of the world's top sports cars, from a Ferrari Testarosa to a Lamborghini Countach to a Lotus Esprit Turbo. Each car's acceleration, braking, top speed, etc., is true to form. **Test Drive** displays the interior of the car and the road from the viewpoint of the driver—once inside, you'll see an actual rendition of the dashboard with an inset for the gearshift knob.

The object is to travel over different parts of the highway within a certain time limit. Periodically you'll check in, see how you're doing, get a map and head out again—if you're under your time limit. Standing in your way will be slow or oncoming traffic, falling rocks—and Smokey, of course. A speeding ticket means curtains, so drive carefully.

$44.95. Accolade, 20813 Stevens Creek Blvd., Cupertino, CA 95014. (408) 446-5757. PRESS.
CIRCLE **258** ON READER SERVICE CARD

A ONE, AND A TWO

The ST version of Electronic Arts' **Music Construction Set** is now available for beginning and intermediate musicians. You can compose, play and print music. In fact, there are three different ways to enter notes: you can point to the desired note on the onscreen palette and click it into place on the score; you can click on the onscreen keyboard; or you can just play notes on a MIDI instrument connected to the ST. (Music Construction Set has MIDI In and MIDI Out features, as well as a "Jukebox" play mode and waveform editing, so you can create your own instruments.)

Complete music notation is at your fingertips: whole to thirty-second notes and rests, dotted notes, ties, triplets and quintuplets—add sharps, flats or naturals, or move the notes up or down an octave. You can use six time signatures and any key signature, transpose notes up or down, copy, cut-and-paste, and adjust tempo between 56 to 208 beats per minute, as well as printing sheet music on any ST-compatible graphics printer. The Music Construction Set also plays three voices at once, chosen from 16 preprogrammed instruments.

$39.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 571-7171. PRESS.
CIRCLE **247** ON READER SERVICE CARD ■

*New ST product notices are compiled from information provided by the products' manufacturers. **Antic** assumes no responsibility for the accuracy of these notices or the performance of the product. Each mention is followed by a code word indicating that, at press time, **Antic** had seen a FINAL marketable version, near-final BETA, earlier ALPHA, incomplete DEMO, or PRESS release.*

CIRCLE **001** ON READER SERVICE CARD

Tap the Power of Your System Clock

Improve your timing with ST BASIC

A few weeks ago I wrote a set of benchmarks to test a variety of personal computers, including the ATARI ST. The benchmarks (integer math, real math, logarithmic and trigonometric functions, screen output speed and disk I/O speed) had to be written in BASIC, the language included free with every PC I tested.

As I was writing the benchmarks, the time came when I had to access the system clock from BASIC, and on my own ST, I found out that I couldn't. Well, after reading everything I could get my hands on about the system clock, I discovered that, although there seem to be two clocks running in the ST simultaneously, there is no way to *directly* access either one of them from ST BASIC.

Okay then, we'll do it in assembly language. This is the basic idea:

- write an assembly language routine to read the system clock, decode the time, and store it in memory
- assemble the routine
- write a BASIC program, incorporating the machine language instructions (assembler output) to access the memory locations containing the time, read the time and display it.

And that's it. Sounds fairly easy, doesn't it? Well, it's not quite that easy, and here's why. GEMDOS offers two function calls to access the clock: **$2C (GET TIME)** and **$2D (SET TIME)**. The **GET TIME** call requires no parameters, and returns the time in the low word of the 68000's data register **D0**. continued on next page

By STEPHEN ORIOLD

Unfortunately, it's so well-encoded that it'll make your life miserable. This GEMDOS clock starts running immediately at start-up (whether you set it first or not), although it might not have the right time, using instead the time preset by ATARI. The **GET TIME** call returns the hour of the day, minutes and seconds. GEMDOS uses different calls (**$2A**, **GET DATE** and **$2B**, **SET DATE**) to access the system date.

There are other ways to access the clock: through IKBD (intelligent keyboard) commands **$1B** (**Set clock**) and **$1C** (**Read clock**), or XBIOS calls 22 (**settime**) and 23 (**gettime**). Both the IKBD and the XBIOS call return both the date and the time of day. The IKBD call returns this information in packed BCD, in six bytes and a time of day event header. The XBIOS **gettime** call requires no parameters and returns the date and time, encoded, in a longword, with the time in the low order word.

I decided to use the GEMDOS call for my application. Let's take a closer look at this GEMDOS time. The **GET TIME** call returns the time in register D0, encoded in a special pattern of individual bits. Take a look at Figure 1 and you'll see what I mean.

The number of seconds is stored in bits 0-4 (five bits). Since the maximum number you can represent in five bits is 31, the GEMDOS clock runs in two-second increments. To get the correct number of seconds, the value stored in these five bits has to be multiplied by two.

The number of minutes is stored in bits 5-10 (six bits), the number of hours, in 24-hour format, in bits 11-15 (five bits). In the above example, the value of hours is 17 (5 pm), the value of minutes is 32, and the value of seconds is 8, translating to 16 seconds (17:32:16).

I wrote TIME.S, the assembly language source file in *Listing 1*, to read, decode and store the GEMDOS time. It was assembled using DRI'S AS68, on an upgraded one-megabyte 520ST.

Here is what this program is doing:

Line 1—save assembly language routine address in A1.

Line 2—push GEMDOS function call number on stack

Line 3—execute function call

Line 4—repair stack

Line 5—move time bit pattern to D1

Line 6—keep bits representing seconds, set everything else to zeroes

Line 7—multiply number of seconds by 2

Line 8—save bit pattern representing seconds in memory, in the first word immediately following the assembly language routine

Line 9—shift bit pattern 5 positions to the right, truncating bits representing seconds, shift zeroes into high-order bits

Line 10—move resulting bit pattern, representing minutes and hours into the second word in memory, following the assembly language routine

Line 11—keep bits representing minutes, set everything else to zeroes

Line 12—shift bit pattern 6 positions to the right, truncating bits representing minutes, shift zeroes into high order bits

Line 13—move resulting bit pattern, representing now only the number of hours, into the third available word in memory.

Line 14—return control to the program that issued the CALL.

That was the assembly language part. Now comes the BASIC program in *Listing 2*. This will create an integer array, consisting of the opcodes output by the assembler, found in the data statements. The 0th element of the array will contain the address of the machine language program, elements 21, 22 and 23 the seconds, minutes and hours. The program will read the address in element 0, then **CALL** the machine language routine, create a nice string containing the time data and output it.

If you intend to use this BASIC program as a subroutine in your own programs, move line 1040 to the initialization module of your own program, delete lines 1060-1080, 1320-1330 and all the REMarks, especially the one in line 1400.

This is not the only, probably not even the best way to access the system clock from ST BASIC. But it's simple, short, fast enough (for ST BASIC) and it can get the job done, until a better BASIC comes along.

USING GFA BASIC

Sometimes, you have to do radically different things to get the same job done in another version of the same language. Take, for example, GFA BASIC. Here, no machine language help is needed. GFA gives almost full access to the complete power of your Atari ST.

Examine *Listing 3*. This is the same program, written in GFA BASIC, but also show how to *set* the time and date as well as access them. Of course, getting the Time and Date from GFA is as easy as stating: **T$=TIME$**, or **D$=DATE$**. Actually *setting* the time, however, is a bit more involved. Let's investigate how this is done.

Get_the_date

	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
DO	• • • • • • • • • • • • • • • •	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0
		HOURS					MINUTES						SECONDS				

Figure 1

This routine first allows the user to type in the date in the typical format used in North America, MM/DD/YYYY. The interesting line here is:

Let Datein% = (Year * 512) + (Month * 32) + (Day).

After we've determined we have the proper numbers for the year, month and day we use multiplication to "left-shift" the bit-patterns for the date numbers into their proper positions, and then add them together into a single, four-byte long number, suitable for passing to the proper **Gemdos( )** routine.

Handle_d_key

This procedure will collect keystrokes into the format of the date we want.

Get_the_time

The routine operates in essentially the same manner as the date routine. The proper digits are collected into a string, which is then taken apart to aquire the proper digits for passing to the Gemdos routine to set the time.

Finally, when the Time and Date have been grabbed and set, the programs returns to the top, where a small Alert Box is built up out of the current **Time$** and **Date$**, and the results are reported. And that's all there is to it! I hope these simple BASIC routines can help you read your ST's internal clock, and that I've come to your aid—in time.

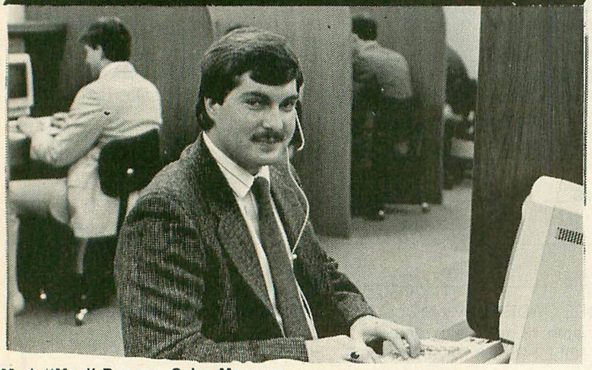
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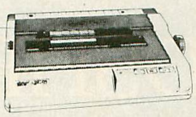
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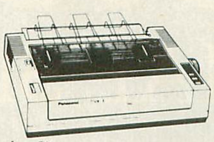
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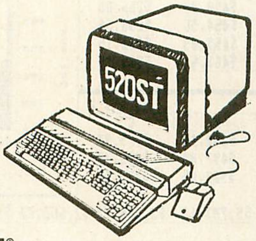
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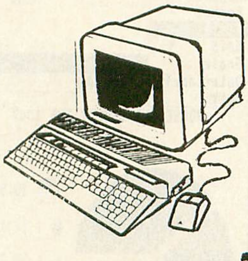
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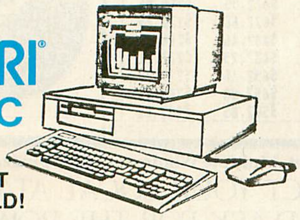
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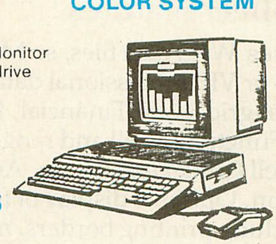
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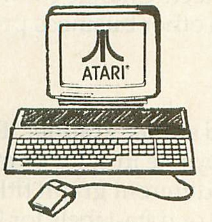
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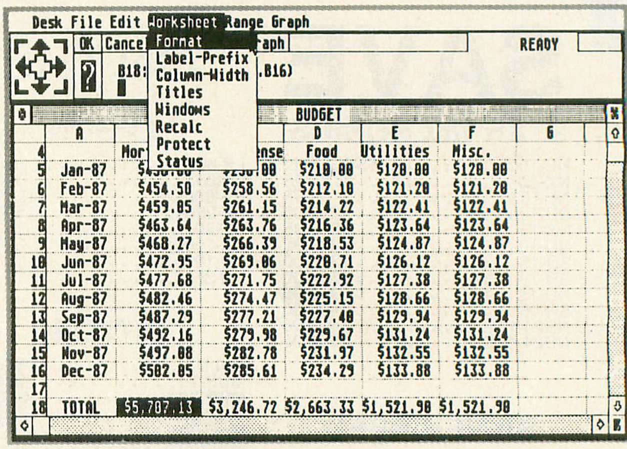
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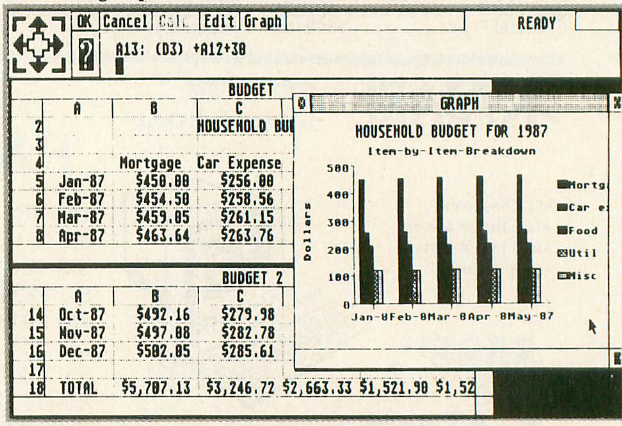
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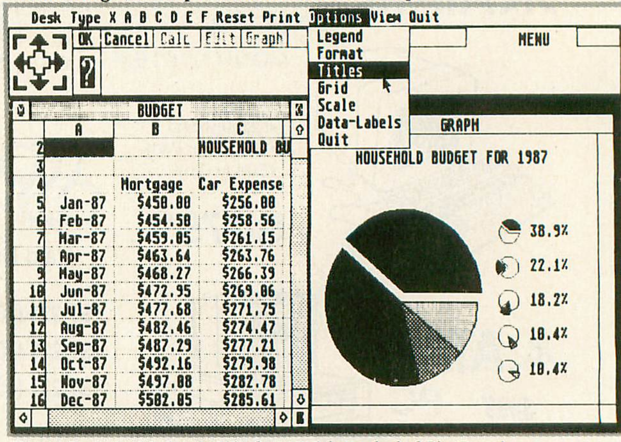
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MasterPlan

A scaled-down version of VIP GEM with a whole new feel

By MATT G. LOVELESS

I tend to sort spreadsheets into three categories. There are the clumsy spreadsheets: those which are either too slow or too "vanilla" to bother with (I'd much rather punch away at my HP-41 calculator). Then there are the power-user spreadsheets: those which sport 3000 functions, a manual the size of a calculus textbook, and require a degree in Lotus to balance a checkbook. Finally, there are spreadsheets like **MasterPlan**: those which offer a delightful blend of simplicity, consistency and power.

MasterPlan is a scaled-down version of Ditek International's own VIP GEM (reviewed in the Fall 1987 issue of START). They took their successful Lotus 1-2-3 clone and trimmed off the fat. They removed macros, combined many of the more esoteric functions and streamlined the user-interface.

On the surface, MasterPlan looks a great deal like VIP GEM (see Figure 1). The screen layout is virtually identical and many of MasterPlan's features and operations will be familiar to VIP users. However, MasterPlan doesn't really feel like VIP GEM, and this is an improvement, since VIP GEM tries too hard to maintain much of the Lotus 1-2-3 structure and layout. MasterPlan, on the other hand, uses an entirely new (simplified) organization, allowing quick and easy access to the most frequently-used commands. One great improvement over VIP GEM: MasterPlan operates almost entirely within the GEM interface, utilizing dialog and file-selector boxes—the strange absence of GEM features in some of VIP's functions was one of my biggest complaints about the product.

However, the underlying guts of the program are essentially VIP GEM, which is also good. MasterPlan operates with a powerful and accurate math package, supporting all of VIP's functions and operators (hence, 1-2-3's also). These include a full array of financial, logical, trigonometric and statistical functions as well as date operations and lookup tables. As an added bonus, MasterPlan will read Lotus and VIP .WKS worksheet files (ignoring any macros).

Although MasterPlan is no speed demon when it comes to scrolling, moving around the spreadsheet is nonetheless quick and effortless (with either the keyboard or mouse) once you become skilled at using the scroll bars, tab buttons and express arrows. Also, you need do very little mode switching from mouse to keyboard—you can access nearly all of MasterPlan's functionality from either.

Range and cell specification is also simple. You can either select a range with the mouse or the keyboard and have it entered automatically into your formulas, or you

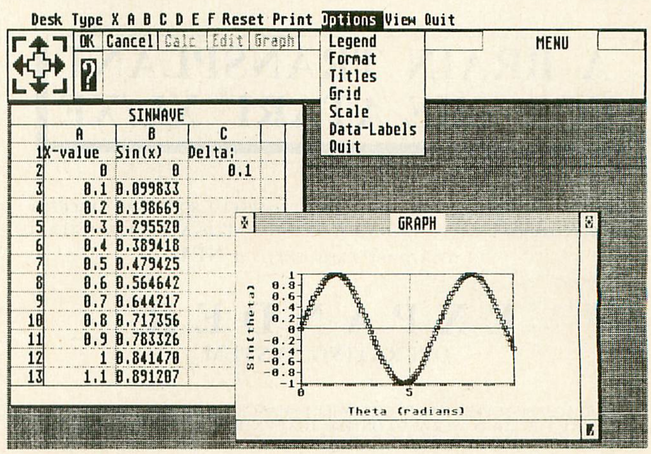


Figure 1

can merely type in the individual cell or range of cells manually. You can even label cell ranges and refer to them by name whenever you want to use them.

Like VIP GEM, you access MasterPlan's command structure through the GEM drop-down menus. If you make a selection that brings you into a sub-menu, the current menu bar is replaced with a new set of selections. In most cases, this is a straightforward operation. However, since all the menus look familiar, it's easy to get lost down one or two levels. To add to the confusion, the menus often change to reflect the widest range of options—sometimes

continued on next page

removing some of the "roadsigns" that might otherwise indicate your location. However, this is only a minor complaint. After a day or two of use, you easily adapt to it. You can also branch through the menus with the keyboard. This is good for quick operations when you don't want to reach across the desk for the mouse. Unfortunately, one of the few bugs I found in the program inadvertently locks-out certain menu selections.

MasterPlan's graphing facility is virtually identical to VIP GEM's. MasterPlan supports bar charts, line graphs and pie graphs. Graphing data can be as simple as specifying a range and requesting a chart type. The chart appears in a GEM window which can then be moved around the screen and can be left open while you operate on the spreadsheet (see Figure 1). You can change the titles on the graph and graph up to six sets of data simultaneously. MasterPlan will also use the built-in ST screendump facility, or else save the graph as a DEGAS .PI2 or .PI3 (medium-res color or high-res monochrome).

MasterPlan's manual is a subset of the VIP GEM manual. However, it has gone through a major revision: the large but terse VIP tome has been scalpeled down (by nearly 100 pages) to a friendly and easy-to-read instruction manual. The paragraphs are smaller, the sentences shorter, the construction clearer. Overall, the manual is better organized and much easier to read. However, it still has some sore spots. At times the manual can be vague, using weak verbs and unidentified pronouns, and the writers have a nasty habit of renaming the keys on the ST keyboard—for example, the [Insert] key is called the [end] key and [Shift][Undo] becomes [break]. Strange.

MasterPlan is not copy-protected and comes on a single-sided diskette. The disk contains the MasterPlan program and a UTIL folder, both of which you can easily transplant to a hard disk. It will run in both color and monochrome, and it will operate with 512K or more memory. The manual comes laser-printed and spiral bound (it lies flat!). The only thing missing is a sampling of already created spreadsheets.

At $129.95, MasterPlan may be a bit expensive, but there is a phrase that says, "benefits sell, not features." This product is loaded with benefits. Buy it. ■

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DOS COMPATIBILITY: All 8-bit programs published by **Antic** are tested to work with Atari Disk Operating System (DOS) 2.0S and 2.5—*not* with the incompatible DOS 3.0. DOS 2.0S is available on each Antic Monthly Disk. Copy the DOS.SYS and DUP.SYS files.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL −
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O		SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL X
	CTRL A		CTRL Y
	CTRL B		CTRL Z
	CTRL C		ESC SHIFT DELETE
	CTRL D		ESC SHIFT INSERT
	CTRL E		ESC CTRL TAB
	CTRL F		ESC SHIFT TAB
	CTRL G		CTRL .
	CTRL H		CTRL ;
	CTRL I		SHIFT =
	CTRL J		ESC CTRL 2
	CTRL K		ESC CTRL DELETE
	CTRL L		ESC CTRL INSERT
	CTRL M		
	CTRL N		
	CTRL O		
	CTRL P		
	CTRL Q		
	CTRL R		
	CTRL S		
	CTRL T		
	CTRL U		
	CTRL V		
	CTRL W		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, ***hold it down*** while you press the next key. Whenever the ESC key is pressed, ***release*** it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key. Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL		STANDARD	
	CTRL F	/	/
	CTRL G	\	SHIFT +
	CTRL N	_	SHIFT −
	CTRL R	−	−
	CTRL S	+	+

HOW TO USE TYPO II (8-BIT)

TYPO II automatically proofreads **Antic**'s type-in BASIC listings for 8-bit Atari computers. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at the left of the line number. Press the [RETURN] key.

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME"[RETURN](Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II "
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? " TYPO II
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press RETURN and edit line a
   bove.":GOTO 32050
```

streamline your personal projects like the pros

C-P PROJECT MANAGER

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LISTING 1

Don't type the TYPO II Codes!

```
EI 1 REM ********************************
XW 2 REM *PRACTICAL PROGRAMMING CONTEST*
   3 REM *       >>>   WINNER  <<<      *
JG 4 REM *CRITICAL PATH PROJECT MANAGER*
CP 6 REM *        BY DAVID SCHWENER     *
TS 8 REM *  (c)1987, ANTIC PUBLISHING   *
EQ 9 REM ********************************
NE 10 GOTO 4830
PK 20 IF LAST=Q0 THEN POSITION 16,Q10:? "
   No data!":GOTO 310
FA 30 GOSUB 320:POKE 82,12:? :POSITION 12
   ,Q9:WIDTH=15:LENGTH=Q4:CMD=Q0:GOSUB 69
   0:POKE 82,Q0
UD 40 POKE 712,66:POSITION 14,Q10:? "Calc
   ulating":POSITION 13,11:? "Critical Pa
   th":CALC=Q1
SN 50 A(Q1,Q3)=A(Q1,Q1):IF LAST=Q1 THEN 3
   00
QT 60 FOR I=Q2 TO LAST
SQ 70 IF A(I,Q1) THEN A(I,Q3)=A(I,Q1):GOT
   O 160
HV 80 FLAG=Q0:DUR=-1
BL 90 FOR J=Q5 TO Q9
DG 100 FOR K=Q1 TO I-Q1:IF A(I,J)=A(K,Q0)
    THEN POP :GOTO 120
EG 110 NEXT K:GOTO 130
ND 120 IF A(K,Q2)+A(K,Q3)>DUR THEN DUR=A(
   K,Q2)+A(K,Q3):FLAG=K
GH 130 NEXT J
RO 140 IF FLAG=Q0 THEN A(I,Q3)=Q0:GOTO 16
   0
PG 150 A(I,Q3)=A(FLAG,Q3)+A(FLAG,Q2)
GD 160 NEXT I
AZ 170 A(LAST+Q1,Q3)=A(LAST,Q3):A(LAST+Q1
   ,Q2)=Q0
LT 180 A(LAST+Q1,Q4)=A(LAST+Q1,Q3)
ZI 190 FOR I=LAST TO Q1 STEP -1
XU 200 DUR=9999:FLAG=Q1
KC 210 FOR J=I+Q1 TO LAST
QY 220 FOR K=Q5 TO Q9
EY 230 IF A(J,K)=A(I,Q0) THEN POP :GOTO 2
   50
HG 240 NEXT K:GOTO 260
IO 250 IF A(J,Q4)-A(I,Q2)<DUR THEN DUR=A(
   J,Q4)-A(I,Q2):FLAG=J
GO 260 NEXT J
WB 270 IF FLAG=Q1 THEN FLAG=I+Q1
TI 280 A(I,Q4)=A(FLAG,Q4)-A(I,Q2):IF A(I,
   Q4)<A(I,Q3) THEN A(I,Q4)=A(I,Q3)
GK 290 NEXT I
UE 300 GOSUB 360
ZB 310 RETURN
VQ 320 SCRN1=PEEK(88)+PEEK(89)*256
YK 330 SCRN2=SCRN1-1024:GOSUB 5300
BU 340 A=USR(ADR(MOVE$),SCRN1,SCRN2,980)
ZJ 350 RETURN
IB 360 POSITION Q0,Q0:? " ";
BU 370 A=USR(ADR(MOVE$),SCRN2,SCRN1,980)
ZP 380 RETURN
FD 390 POKE 764,255:POKE 694,Q0:GOSUB 530
   0
NA 400 GET #Q1,A
ZC 410 RETURN
CC 420 W=Q1:G$=""
```

continued on next page

```
VU 430 GOSUB 390
UE 440 IF A=126 AND W>Q1 THEN ? CHR$(126);".⊞";:G$(W-Q1,W-Q1)=CHR$(32):W=W-Q1:GOTO 430
BZ 450 IF W>SIZE THEN 470
NO 460 IF A>31 AND A<123 THEN G$(W,W)=CHR$(A):? CHR$(A);:W=W+Q1:GOTO 430
BU 470 IF A=155 OR A=27 THEN RETURN
OK 480 GOTO 430
CQ 490 W=Q1:G$=""
VQ 500 GOSUB 390
NQ 510 IF A=126 AND W>Q1 THEN ? CHR$(126);".⊞";:G$(W-Q1,W-Q1)=CHR$(32):W=W-Q1:GOTO 500
AD 520 IF W>SIZE THEN 540
WZ 530 IF A>47 AND A<58 THEN G$(W,W)=CHR$(A):? CHR$(A);:W=W+Q1:GOTO 500
LT 540 IF (A=155 AND W>Q1) OR A=27 THEN RETURN
NI 550 GOTO 500
WS 560 IF LEN(G$)<Q8 THEN 2060
PG 570 DATE$=G$
YW 580 MONTH=VAL(DATE$(Q1,Q2)):IF MONTH<Q1 OR MONTH>12 THEN 2060
YY 590 DAY=VAL(DATE$(Q4,Q5)):IF DAY<Q1 OR DAY>31 THEN 2060
JF 600 YEAR=VAL(DATE$(Q7,Q8))+1900
BZ 610 Z1=YEAR-INT(Q1/(MONTH+Q1)+0.7)
SN 620 Z2=(MONTH+Q1)+12*INT(Q1/(MONTH+Q1)+0.7)
DO 630 Z3=INT(Z1*365.25):Z4=INT(Z2*30.6001):Z5=Z3+Z4+DAY:WD=Z5-Q7*INT(Z5/Q7)
ZK 640 RETURN
QB 650 YR=INT((Z5-122.1)/365.25)
PQ 660 MN=INT((Z5-INT(365.25*YR))/30.6001)
EO 670 DAY=Z5-INT(365.25*YR)-INT(30.6001*MN):MONTH=MN-Q1-12*(MN>13):YEAR=YR+Q1*(MONTH<Q3):WD=Z5-Q7*INT(Z5/Q7)
ZS 680 RETURN
PX 690 YY=PEEK(84)
AE 700 ? "┌";BORDER$(Q1,WIDTH-Q2);"┐"
NT 710 IF CMD>Q0 THEN POSITION X,YY:? "┘";BLANK$(Q1,CMD);"└"
GR 720 FOR I=Q1 TO LENGTH-Q2
HO 730 ? "▐";BLANK$(Q1,WIDTH-Q2);"▌"
GF 740 NEXT I
AU 750 ? "└";BORDER$(Q1,WIDTH-Q2);"┘"
ZP 760 RETURN
OA 770 TRAP 5270
OA 780 GRAPHICS Q0:POKE 82,Q0:POKE 752,Q1
HH 790 POKE 710,Q2:POKE 709,Q2:GOSUB 5300
TL 800 POSITION Q2,Q0:? LOGO$
WK 810 POKE 82,Q8:?
TJ 820 ? "◥";BLANK$(Q1,22);"◤"
AU 830 ? "■";SPACE$(Q1,22);"■"
ZL 840 ? "■ Main Menu Selections ■"
AY 850 ? "■";SPACE$(Q1,22);"■"
UJ 860 ? "◤";BLANK$(Q1,22);"◥"
CZ 870 ?
GX 880 ? "▀";BORDER1$(Q1,22);"▀"
DL 890 ? "▐ 1.Load/Save a File    ▌"
QW 900 ? "▐ 2.Project Information▌"
WZ 910 ? "▐ 3.Gantt Chart        ▌"
WK 920 ? "▐ 4.Report Writing     ▌"
HY 930 ? "▄";BORDER1$(Q1,22);"▄"
NJ 940 ? :? "       Selection?"
IB 950 POKE 709,Q10
BR 960 GOSUB 390:A=A-48:IF A<Q0 THEN 960
VE 970 ON A GOTO 990,1630,2330,3670
RU 980 GOTO 960
PQ 990 GRAPHICS Q0:POKE 82,Q0:POKE 752,Q1:POKE 83,39:POKE 710,18:POKE 709,18
JX 1000 GOSUB 5300:POSITION Q2,Q0:? LOGO$
HJ 1010 POKE 82,Q8:?
BO 1020 ? "◥";BLANK$(Q1,21);"◤"
LD 1030 ? "■";SPACE$(Q1,21);"■"
WM 1040 ? "■ Load/Save a Project ■"
LJ 1050 ? "■";SPACE$(Q1,21);"■"
CS 1060 ? "◤";BLANK$(Q1,21);"◥"
OA 1070 ?
AG 1080 ? "   ▀";BORDER1$(Q1,17);"▀"
ZC 1090 ? "   ▐ 1.Load a file    ▌"
IM 1100 ? "   ▐ 2.Save a file    ▌"
EY 1110 ? "   ▐ 3.Disk Directory▌"
DF 1120 ? "   ▐ 4.Main Menu      ▌"
BJ 1130 ? "   ▄";BORDER1$(Q1,17);"▄"
BU 1140 ? :? "       Selection?"
SF 1150 POKE 709,Q10
TH 1160 GOSUB 390:A=A-48:IF A<Q0 THEN 1160
JJ 1170 ON A GOTO 1190,1190,1190,770
RA 1180 GOTO 1160
FR 1190 Y=A:GOSUB 320
FW 1200 FNAME$=""
KG 1210 FNAME$(Q1,Q3)="D :"
OI 1220 POKE 82,3:POSITION Q3,Y+12:WIDTH=35:LENGTH=Q3:CMD=Q9:X=14:GOSUB 690
DV 1230 POSITION Q4,Y+13:? "Enter drive number => ";FIELD$(Q1,Q1);LEFT$(Q1,Q1);:SIZE=Q1:GOSUB 490
YY 1240 IF A=27 THEN 1590
HS 1250 I=VAL(G$):IF I<Q0 OR I>Q8 THEN 1230
SX 1260 FNAME$(Q2,Q2)=STR$(I)
NF 1270 IF Y=Q3 THEN 1520
AY 1280 POSITION Q4,Y+13:? "Enter filename => ";FNAME$(Q1,Q3);FIELD$(Q1,Q8);" .PRJ";LEFT$(Q1,12);:SIZE=Q8:GOSUB 420
ZN 1290 IF A=27 THEN 1590
YG 1300 FNAME$(LEN(FNAME$)+Q1)=G$
RI 1310 FNAME$(LEN(FNAME$)+Q1)=".PRJ"
LM 1320 IF Y=Q2 THEN 1420
DV 1330 TRAP 1600:CLOSE #Q2:OPEN #Q2,Q4,Q0,FNAME$
UV 1340 INPUT #Q2;LAST
CI 1350 FOR I=Q1 TO LAST:FOR J=Q0 TO Q9:INPUT #Q2;K:A(I,J)=K
MN 1360 NEXT J:INPUT #Q2;TNAME$:PROJECT$(I*25+Q1,I*25+25)=TNAME$
FQ 1370 NEXT I
MT 1380 INPUT #Q2;TNAME$:PROJECT$(Q1,25)=TNAME$:INPUT #Q2;PSTART:INPUT #Q2;SCALE
DS 1390 FOR I=Q0 TO Q6
ZG 1400 INPUT #Q2;J:WORK(I)=J:NEXT I
MU 1410 CALC=Q1:GOSUB 4110:GOTO 1510
RP 1420 IF  NOT CALC THEN GOSUB 20
JL 1430 TRAP 1600:CLOSE #Q2:OPEN #Q2,Q8,Q0,FNAME$
TA 1440 PRINT #Q2;LAST
SE 1450 FOR I=Q1 TO LAST:FOR J=Q0 TO Q9:K=A(I,J):PRINT #Q2;K
XV 1460 NEXT J:TNAME$=PROJECT$(I*25+Q1,I*25+25):PRINT #Q2;TNAME$
FS 1470 NEXT I
MH 1480 TNAME$=PROJECT$(Q1,25):PRINT #Q2;TNAME$:PRINT #Q2;PSTART:PRINT #Q2;SCALE
DU 1490 FOR I=Q0 TO Q6
QJ 1500 J=WORK(I):PRINT #Q2;J:NEXT I
QN 1510 CLOSE #Q2:GOTO 770
AF 1520 FNAME$(LEN(FNAME$)+Q1)="*.PRJ"
RD 1530 ? "↰":? "DIRECTORY OF DRIVE ";FNAME$(Q2,Q2);" PROJECTS":?
GW 1540 TRAP 1600:CLOSE #Q2:OPEN #Q2,Q6,Q0,FNAME$
BZ 1550 TRAP 1570:FOR I=Q1 TO 64
LP 1560 INPUT #Q2,FNAME$:? FNAME$:NEXT I
EM 1570 CLOSE #Q2
MD 1580 ? :? "PRESS ANY KEY TO CONTINUE":GOSUB 390
AL 1590 GOSUB 360:GOTO 1160
VE 1600 POKE 82,12:? :POSITION 12,15:WIDTH=15:LENGTH=Q4:CMD=Q0:GOSUB 690:POKE 82,Q0
HF 1610 POSITION 14,16:? "ERROR # ";PEEK(195):POSITION 13,17:? "press any key"
RJ 1620 GOSUB 390:GOSUB 360:GOTO 1160
CO 1630 GRAPHICS Q0:POKE 752,Q1:POKE 710,34:POKE 709,34
AG 1640 POKE 82,Q0:POKE 83,39
KY 1650 GOSUB 5300:POSITION Q2,Q0:? LOGO$
OG 1660 ? BORDER1$(Q1,40);
RI 1670 POSITION Q6,Q5:? INFO$(Q1,24);INFO1$(25,28)
OM 1680 ? BORDER1$(Q1,40);
VG 1690 POSITION Q7,Q6:? "┬":POSITION 31,Q6:? "┬"
OP 1700 ? "          ▐ use ↑↓ or ←→ then RETURN▌"
EC 1710 ? "          └";BORDER1$(Q1,23);"┘"
IA 1720 POKE 82,Q8:?
CF 1730 ? "◥";BLANK$(Q1,21);"◤"
LU 1740 ? "■";SPACE$(Q1,21);"■"
RD 1750 ? "■ Project Information ■"
MA 1760 ? "■";SPACE$(Q1,21);"■"
DJ 1770 ? "◤";BLANK$(Q1,21);"◥"
ZD 1780 POKE 82,Q0:POKE 709,Q10
OU 1790 ?
BI 1800 ? "Project Name:";PROJECT$(Q1,25):?
HJ 1810 IF PSTART=Q0 THEN ? " NEED A START DATE TO CONTINUE ":? :GOTO 1850
YP 1820 Z5=PSTART:GOSUB 650
TZ 1830 ? "Start Date   :";
YR 1840 ? WEEKDAY$(WD*Q9+Q1,WD*Q9+Q9);" ";MONTH$(MONTH*Q3-Q2,MONTH*Q3);" ";DAY;",";YEAR;" ":?
IP 1850 ? "Time Scale   :";SCALE$(SCALE*Q5+Q1,SCALE*Q5+Q5);"   ":?
```

```
KF 1860 ? "Work Days   :";
GJ 1870 ? SPACE$(Q1,25);LEFT$(Q1,25);
DM 1880 IF SCALE<>Q0 THEN 1920
EC 1890 FOR I=Q0 TO Q6
LJ 1900 IF WORK(I)=Q1 THEN ? WEEKDAY$(I*Q
   9+Q1,I*Q9+Q2);" ";
FK 1910 NEXT I
QQ 1920 X=30
BD 1930 GOSUB 390
FL 1940 IF A=155 THEN Y=X/Q6:ON Y GOTO 20
   00,2050,2100,2170,2300
HK 1950 IF CHR$(A)="+" THEN X=X-Q6:IF X<Q
   6 THEN X=30
VH 1960 IF CHR$(A)="*" THEN X=X+Q6:IF X>3
   0 THEN X=Q6
IZ 1970 POSITION Q6,Q5:? INFO$
AL 1980 POSITION X,Q5:? INFO1$(X-Q5,(X-Q5
   )+Q4)
TY 1990 GOTO 1930
CQ 2000 GOSUB 320:POKE 82,Q5:? :POSITION
   Q5,Q6:WIDTH=30:LENGTH=Q7:CMD=Q3:GOSUB
   690
CT 2010 POSITION Q9,Q8:? "Enter NEW Proje
   ct Name:"
DA 2020 POSITION Q8,Q10:? FIELD$(Q1,25);L
   EFT$(Q1,25);:SIZE=25:GOSUB 420
SG 2030 IF A=27 THEN 2320
CA 2040 PROJECT$(Q1,25)=SPACE$(Q1,25):PRO
   JECT$(Q1,LEN(G$))=G$:GOTO 2320
HS 2050 GOSUB 320:POKE 82,11:? :POSITION
   11,Q6:WIDTH=28:LENGTH=Q7:CMD=Q3:GOSUB
   690
MR 2060 POSITION 15,Q8:? "Enter NEW Start
    Date"
HG 2070 POSITION 20,Q10:? "../../..";LEFT
   $(Q1,Q8);:SIZE=Q8:GOSUB 420
SV 2080 IF A=27 THEN 2320
FF 2090 GOSUB 560:PSTART=Z5:GOTO 2320
ZG 2100 GOSUB 320:POKE 82,17:? :POSITION
   17,Q6:WIDTH=12:LENGTH=12:CMD=Q3:GOSUB
   690
JD 2110 POSITION 18,Q8:? "Enter NEW":POSI
   TION 18,Q9:? "Time Scale"
UB 2120 POSITION 20,11:? "0=Day":POSITION
    20,12:? "1=Week":POSITION 20,13:? "2=
   Month":POSITION 20,15:? "=>";
CJ 2130 ? FIELD$(Q1,Q1);LEFT$(Q1,Q1);:SIZ
   E=Q1:GOSUB 490
SL 2140 IF A=27 THEN 2320
CC 2150 SCALE=VAL(G$):IF SCALE<Q0 OR SCAL
   E>Q2 THEN 2120
QE 2160 GOTO 2320
AA 2170 GOSUB 320:POKE 82,23:? :POSITION
   23,Q6:WIDTH=11:LENGTH=16:CMD=Q3:GOSUB
   690
ZI 2180 POSITION 24,Q8:? "Enter NEW":POSI
   TION 24,Q9:? "Work Days"
DP 2190 FOR I=Q0 TO Q6
QI 2200 POSITION 26,11+I:? CHR$(177+I);"=
   ";CHR$(ASC(WEEKDAY$(I*Q9+Q1,I*Q9+Q1))+
   128*(WORK(I)=Q0));
YQ 2210 ? CHR$(ASC(WEEKDAY$(I*Q9+Q2,I*Q9+
   Q2))+128*(WORK(I)=Q0))
VT 2220 NEXT I:POSITION 26,18:? "0=QUIT"
GT 2230 POSITION 26,20:? "=>";:? FIELD$(Q
   1,Q1);LEFT$(Q1,Q1);:SIZE=Q1:GOSUB 490
SN 2240 IF A=27 THEN 2320
SR 2250 I=VAL(G$)
FK 2260 IF I=Q0 THEN 2320
HZ 2270 IF I<Q1 OR I>Q7 THEN 2180
LB 2280 WORK(I-Q1)=WORK(I-Q1)+Q1:IF WORK(
   I-Q1)=Q2 THEN WORK(I-Q1)=Q0
SR 2290 GOTO 2180
YH 2300 IF PSTART=Q0 THEN 2320
HM 2310 GOSUB 4110:GOTO 770
BZ 2320 GOSUB 360:GOTO 1640
BP 2330 IF PSTART=Q0 THEN 1630
YM 2340 Z5=PSTART:GOSUB 650
BW 2350 GRAPHICS Q0:POKE 82,Q0:POKE 752,Q
   1:POKE 83,39:POKE 710,194:POKE 709,194

KW 2360 GOSUB 5300:POSITION Q2,Q0:? LOGO$

MO 2370 POKE 82,12:POSITION 12,Q0
WN 2380 ? "";BLANK$(Q1,12);"Start Dat
   e:"
GA 2390 ? "     Gantt      "
DQ 2400 ? "     Chart       ";WEEKDAY$(WD
   *Q9+Q1,WD*Q9+Q9)
LD 2410 ? "";BLANK$(Q1,12);"";MONTH$(
   MONTH*Q3-Q2,MONTH*Q3);" ";DAY;",";YEAR

DF 2420 POKE 82,Q0:?
YL 2430 FOR I=Q4 TO Q6 STEP Q2
JD 2440 POSITION Q0,I:? BORDER1$(Q1,40);:
   NEXT I
EK 2450 POSITION 12,Q4:? "":POSITION 27,
   Q4:? ""
HO 2460 POSITION Q3,Q5:? GANTT1$(Q1,Q3);G
   ANTT$(Q4,35);
SS 2470 POKE 709,Q10
CE 2480 GOSUB 4240
JX 2490 POKE 712,Q0
AK 2500 X=Q3
AQ 2510 GOSUB 390
IZ 2520 IF A=155 THEN Y=INT(X/Q5)+Q1:ON Y
    GOTO 2580,2580,2580,2580,3490,3650,77
   0
GW 2530 IF CHR$(A)="+" THEN X=X-Q5:IF X<Q
   3 THEN X=33
VL 2540 IF CHR$(A)="*" THEN X=X+Q5:IF X>3
   5 THEN X=Q3
QE 2550 POSITION Q3,Q5:? GANTT$
QC 2560 POSITION X,Q5:? GANTT1$(X-Q2,X);
RA 2570 GOTO 2510
GY 2580 GOSUB 320:POKE 82,Q2:POSITION 0,0
   :? :POSITION Q2,Q6:WIDTH=36:LENGTH=Q9:
   CMD=Q1:GOSUB 690
BH 2590 INS=Q0:IF Y=Q2 THEN INS=Q1
SB 2600 CHANGE=Q0:IF Y=Q3 THEN CHANGE=Q1
XC 2610 DELETE=Q0:IF Y=Q4 THEN CHANGE=Q1:
   DELETE=Q1
DM 2620 POSITION Q3,Q7:? "ID#       (S)tart
    0    (D)uration 0"
QR 2630 ID=Q0:START=Q0:DUR=Q0:FOR I=Q0 TO
    Q4:B(I)=Q0:NEXT I:TNAME$=""
MX 2640 POSITION Q3,Q9:? "(N)ame ";SPACE$
   (Q1,25)
WH 2650 POSITION Q3,11:? "(P)redecessors
   "
CI 2660 POSITION Q2,12:? "";BORDER$(Q1,1
   1);""
OI 2670 POSITION Q3,13:? "Esc to exit  E
   nter ID# first"
FD 2680 POSITION 14,14:? ""
CR 2690 POSITION Q7,Q7:? FIELD$(Q1,Q3);LE
   FT$(Q1,Q3);:SIZE=Q3:GOSUB 490
YV 2700 IF A=27 THEN 3390
SL 2710 ID=VAL(G$):POSITION Q7,Q7:? BLANK
   $(Q1,Q3);LEFT$(Q1,Q3);ID
QX 2720 IF ID=Q0 THEN 2690
XB 2730 IF LAST=Q0 THEN FLAG=Q1:GOTO 2870
RD 2740 FOR FLAG=Q1 TO LAST+(CHANGE=Q1)
AE 2750 IF ID=A(FLAG,Q0) THEN POP :GOTO 2
   790
JE 2760 IF ID<A(FLAG,Q0) AND  NOT CHANGE
   THEN POP :GOTO 2800
XJ 2770 NEXT FLAG:IF CHANGE THEN POSITION
    Q2,13:? ">>> ID# NOT FOUND! PRESS ANY
    KEY <<<":GOSUB 390:GOTO 3390
SE 2780 GOTO 2800
RP 2790 IF  NOT CHANGE THEN POSITION Q2,1
   3:? " >>>  ID# EXISTS! PRESS ANY KEY <
   << ":GOSUB 390:GOTO 3390
RR 2800 IF  NOT INS AND  NOT CHANGE THEN
   2870
AS 2810 IF INS THEN 2850
UW 2820 START=A(FLAG,Q1):DUR=A(FLAG,Q2)
JI 2830 TNAME$=PROJECT$(FLAG*25+Q1,FLAG*2
   5+25)
KK 2840 POSITION 19,Q7:? START:POSITION 3
   4,Q7:? DUR:POSITION Q10,Q9:? TNAME$
NM 2850 FOR I=Q5 TO Q9:B(I-Q5)=A(FLAG,I):
   POSITION Q4*I-Q2,11:? B(I-Q5):NEXT I
HJ 2860 IF DELETE THEN 3400
YA 2870 POSITION 15,13:? "     (F)inished
           ":GOSUB 390:IF A>90 THEN A=A-32
ZV 2880 IF A=27 THEN 3390
BJ 2890 IF A<>83 THEN 2950
KQ 2900 POSITION 19,Q7:? FIELD$(Q1,Q3);LE
   FT$(Q1,Q3);:SIZE=Q3:GOSUB 490
ZC 2910 IF A=27 THEN 3390
PS 2920 START=VAL(G$)
NX 2930 POSITION 19,Q7:? BLANK$(Q1,Q3);LE
   FT$(Q1,Q3);START
VJ 2940 GOTO 2870
SR 2950 IF A<>68 THEN 3010
JK 2960 POSITION 34,Q7:? FIELD$(Q1,Q3);LE
   FT$(Q1,Q3);:SIZE=Q3:GOSUB 490
ZU 2970 IF A=27 THEN 3390
ZD 2980 DUR=VAL(G$)
QE 2990 POSITION 34,Q7:? BLANK$(Q1,Q3);LE
   FT$(Q1,Q3);DUR
UG 3000 GOTO 2870
XC 3010 IF A<>78 THEN 3070
GB 3020 POSITION Q10,Q9:? FIELD$(Q1,25);L
   EFT$(Q1,25);:SIZE=25:GOSUB 420
YR 3030 IF A=27 THEN 3390
DB 3040 TNAME$=G$
```

continued on next page

```
PJ 3050 POSITION Q10,Q9:? TNAME$;BLANK$(Q1,26-LEN(TNAME$));
UY 3060 GOTO 2870
RE 3070 IF A<>70 THEN 3220
XQ 3080 POKE 712,66
CV 3090 IF CHANGE THEN 3150
YA 3100 POKE 712,68
AQ 3110 IF FLAG>LAST THEN 3140
XZ 3120 FOR I=LAST TO FLAG STEP -1:FOR J=Q0 TO Q9:A(I+Q1,J)=A(I,J):NEXT J
VW 3130 PROJECT$((I+Q1)*25+Q1,(I+Q1)*25+25)=PROJECT$(I*25+Q1,I*25+25):NEXT I
DZ 3140 LAST=LAST+Q1
EE 3150 A(FLAG,Q0)=ID:A(FLAG,Q1)=START:A(FLAG,Q2)=DUR:PROJECT$(FLAG*25+Q1,FLAG*25+25)=SPACE$(Q1,25)
QA 3160 PROJECT$(FLAG*25+Q1,FLAG*25+25)=TNAME$
PS 3170 FOR I=Q0 TO Q4:A(FLAG,I+Q5)=B(I):NEXT I
RE 3180 IF  NOT INS THEN 3210
ZL 3190 FOR I=Q5 TO Q9:IF A(FLAG+Q1,I)=Q0 THEN A(FLAG+Q1,I)=ID:POP :GOTO 3210
EV 3200 NEXT I
RO 3210 GOSUB 360:CALC=Q0:GOTO 3380
ZN 3220 IF A<>80 THEN 2870
PI 3230 POSITION 19,Q10:? "A   B   C   D   E"
MV 3240 POSITION Q3,11:? "Select A-E     "
WX 3250 POSITION 15,13:? "Press RETURN when done"
CJ 3260 GOSUB 390:IF A>90 AND A<>155 THEN A=A-32
OL 3270 IF A<>155 THEN 3300
ZY 3280 POSITION Q3,11:? "(P)redecessors:";:POSITION 19,Q10:? BLANK$(Q1,18);
VL 3290 GOTO 2870
YO 3300 IF A=27 THEN 3390
XN 3310 IF A<65 OR A>69 THEN 3260
CC 3320 P=A
UR 3330 POSITION 18+4*(P-65),11:? FIELD$(Q1,Q3);LEFT$(Q1,Q3);:SIZE=Q3:GOSUB 490
LQ 3340 IF VAL(G$)>ID THEN 3330
GC 3350 B(P-65)=VAL(G$)
FY 3360 POSITION 18+Q4*(P-65),11:? BLANK$(Q1,Q3);LEFT$(Q1,Q3);B(P-65)
SL 3370 GOTO 3260
RB 3380 GOTO 2420
ML 3390 GOSUB 360:X=(Y-Q1)*Q5+Q3:GOTO 2510
YR 3400 POSITION 15,13:? "Delete this TASK (Y/N)?"
AP 3410 GOSUB 390
ZE 3420 IF A=27 OR A=78 OR A=110 THEN 3390
EQ 3430 IF A<>89 AND A<>121 THEN 3410
PK 3440 GOSUB 360:POKE 712,64
TW 3450 FOR I=FLAG TO LAST:FOR J=Q0 TO Q9:A(I,J)=A(I+Q1,J):NEXT J
AX 3460 PROJECT$(I*25+Q1,I*25+25)=PROJECT$((I+Q1)*25+Q1,(I+Q1)*25+25):NEXT I
FS 3470 LAST=LAST-Q1
RR 3480 CALC=Q0:POKE 712,Q0:GOTO 3380
OZ 3490 GOSUB 320:POKE 82,21:POSITION 0,0:? :POSITION 21,Q6:WIDTH=17:LENGTH=Q9:CMD=Q1:GOSUB 690
TK 3500 POSITION 23,Q7:? "Screen Moves:":POSITION 22,Q9:? "(U)p     (D)own":POSITION 22,Q10:? "(L)eft  (R)ight"
KM 3510 POSITION 26,11:? "(H)ome":POSITION 24,13:? "Esc to Exit"
AU 3520 GOSUB 390
ZB 3530 IF A=27 THEN 3390
TH 3540 IF A=72 OR A=104 THEN OFFSET=Q1:SCL=Q0:GOTO 3640
CW 3550 IF A<>68 AND A<>100 AND A<>85 AND A<>117 AND A<>82 AND A<>114 AND A<>76 AND A<>108 THEN 3520
RH 3560 A1=A
MM 3570 POSITION 24,13:? "HOW MANY?";
EJ 3580 POSITION 33,13:? FIELD$(Q1,Q2);LEFT$(Q1,Q2);:SIZE=Q2:GOSUB 490
UI 3590 M=VAL(G$)
XU 3600 OFFSET=OFFSET+M*(A1=68 OR A1=100)-M*(A1=85 OR A1=117):IF OFFSET<Q1 THEN OFFSET=Q1
SP 3610 IF OFFSET>50 THEN OFFSET=50
US 3620 SCL=SCL+M*(A1=82 OR A1=114)-M*(A1=76 OR A1=108):IF SCL<Q0 THEN SCL=Q0
LO 3630 IF SCL>94 THEN SCL=94
FC 3640 GOSUB 360:GOTO 3380
WK 3650 GOSUB 20
RB 3660 GOTO 2420
SK 3670 IF  NOT CALC THEN GOSUB 20
MV 3680 GRAPHICS Q0:POKE 82,Q0:POKE 752,Q1:POKE 83,39:POKE 710,146:POKE 709,146
RX 3690 POSITION Q2,Q0:? LOGO$:GOSUB 5300
HW 3700 POKE 82,Q8:?
CY 3710 ? "◩";BLANK$(Q1,22);"◪"
MN 3720 ? "■";SPACE$(Q1,22);"■"
JK 3730 ? "■     Report Writing     ■"
MT 3740 ? "■";SPACE$(Q1,22);"■"
EC 3750 ? "◪";BLANK$(Q1,22);"◩"
ON 3760 ?
WK 3770 ? "▀";BORDER1$(Q1,22);"▀"
PD 3780 ? "▯       Print Size       ▯"
VS 3790 ? "▯                        ▯"
UT 3800 ? "▯                        ▯"
NP 3810 ? "▯  80 col     132 col    ▯"
VX 3820 ? "▀";BORDER1$(Q1,22);"▀"
SP 3830 POKE 709,Q10
PT 3840 A=Q0:GOTO 3870
BJ 3850 GOSUB 390
FV 3860 IF CHR$(A)="+" OR CHR$(A)="*" THEN SMALL=SMALL+Q1:IF SMALL=Q2 THEN SMALL=Q0
LC 3870 IF SMALL=Q1 THEN POSITION 11,14:? "Normal   Condensed"
UX 3880 IF SMALL=Q0 THEN POSITION 11,14:? "Normal   Condensed"
KC 3890 IF A=27 THEN 770
TE 3900 IF A=155 THEN 3920
UM 3910 GOTO 3850
GY 3920 PRT=Q1:POKE 82,Q10:? :POSITION Q10,15:WIDTH=20:LENGTH=Q5:CMD=Q0:GOSUB 690
EW 3930 POSITION 11,16:? "Set at Top of form":POSITION 11,18:? " Any key to print":GOSUB 390:IF A=27 THEN 770
NO 3940 CLOSE #Q3:OPEN #Q3,Q8,Q0,"P:"
UH 3950 RW=80:TL=25:X=Q0:XX=Q0:SCL=Q0:OFFSET=Q1
VF 3960 FOR PAGE=Q1 TO 100
ME 3970 SCL=SCL+X
SS 3980 X=12+13*SMALL
BX 3990 XX=X*(PAGE-Q1)+X-Q1
GH 4000 ? #Q3;"␛";CHR$(18):IF SMALL=Q1 THEN RW=132:? #Q3;"␛";CHR$(15);
VT 4010 ? #Q3:? #Q3:? #Q3:? #Q3
BG 4020 GOSUB 4240
KG 4030 ? #Q3:? #Q3;"LEGEND:     XXXX Critical Path       ---- Slack Time"
NL 4040 ? #Q3;"                >>>> Non-Critical Path    *    Milestone"
ZP 4050 J=Q9+LAST+Q4:FOR I=J TO 66:? #Q3:NEXT I
VX 4060 IF A(LAST,Q2)+A(LAST,Q3)<XX+Q1 THEN POP :GOTO 4080
HD 4070 NEXT PAGE
RB 4080 CLOSE #Q3:OPEN #Q3,Q8,Q0,"S:"
SV 4090 SCL=Q0:PRT=Q0:PAGE=Q1
SR 4100 GOTO 770
EN 4110 FLAG=Q1
NP 4120 POKE 82,12:? :POSITION 12,Q9:WIDTH=15:LENGTH=Q4:CMD=Q0:GOSUB 690:POKE 82,Q0
SN 4130 POSITION 14,10:? "Calculating":POSITION 13,11:? "Calendar Info"
YK 4140 Z5=PSTART:GOSUB 650
MZ 4150 MON=MONTH:DATE1$(FLAG*Q4-Q3,FLAG*Q4-Q1)=MONTH$(MON*3-2,MON*3):DATE1$(FLAG*Q4,FLAG*Q4)=" "
RV 4160 IF DAY<10 THEN DATE2$(FLAG*Q4-Q3,FLAG*Q4-Q3)="0"
PF 4170 DATE2$(FLAG*Q4-Q3+(DAY<10),FLAG*Q4-Q2)=STR$(DAY):DATE2$(FLAG*Q4-Q1,FLAG*Q4)="  "
ER 4180 STP=Q1+6*(SCALE=Q1)+27*(SCALE=Q2):Z5=Z5+STP:FLAG=FLAG+Q1
HK 4182 POSITION 13,10:? CHR$(2*(FLAG/2=INT(FLAG/2))+188)
FA 4183 POSITION 25,10:? CHR$(190-2*(FLAG/2=INT(FLAG/2)))
UE 4190 IF FLAG>A(LAST,Q2)+A(LAST,Q3)+100 THEN 4230
DY 4200 GOSUB 650:IF WORK(WD)=Q0 THEN FLAG=FLAG-Q1:GOTO 4180
FY 4210 IF MON<>MONTH THEN 4150
TF 4220 DATE1$(FLAG*Q4-Q3,FLAG*Q4)="    ":GOTO 4160
AP 4230 RETURN
XJ 4240 IF LAST=Q0 THEN RETURN
HS 4250 POSITION Q2,Q7:? #Q3;PROJECT$(Q1,15+10*PRT)
NG 4260 POKE 712,244:GOSUB 5300
YI 4270 POSITION 15,Q7:IF PRT THEN ? #Q3;SPACE$(Q1,30);
GA 4280 I=Q0:IF DATE1$(SCL*Q4+Q1,SCL*Q4+Q
```

```
   3)<>"    " THEN 4330
CC 4290 FOR I=SCL*Q4+Q1 TO Q1 STEP -4
JC 4300 IF DATE1$(I,I)<>" " THEN 4320
FB 4310 NEXT I
LN 4320 POP :DATE1$(SCL*Q4+Q1,SCL*Q4+Q3)=
   DATE1$(I,I+Q2)
LK 4330 ? #Q3;DATE1$(SCL*Q4+Q1,Q4*(SCL+(Q
   6+PRT*(Q6+13*SMALL)))):IF I<>Q0 THEN D
   ATE1$(SCL*Q4+Q1,SCL*Q4+Q3)="    "
YU 4340 POSITION 15,Q8:IF PRT THEN ? #Q3;
   SPACE$(Q1,30);
NT 4350 ? #Q3;DATE2$(SCL*Q4+Q1,Q4*(SCL+(Q
   6+PRT*(Q6+13*SMALL))))
NL 4360 IF  NOT PRT THEN POSITION Q0,Q9:?
   "ID#  ■■■TASK■■■ ";
MB 4370 IF PRT THEN ? #Q3;"ID#";SPACE$(Q1
   ,12);"TASK";SPACE$(Q1,11);
MK 4380 FOR I=SCL TO SCL+Q5+PRT*(Q6+13*SM
   ALL)
YS 4390 IF I>99 THEN ? #Q3;CHR$(INT(I/100
   )+176-128*PRT);
UQ 4400 IF I>Q9 THEN I1=I-INT(I/100)*100:
   ? #Q3;CHR$(INT(I1/Q10)+176-128*PRT);
VT 4410 I1=I-INT(I/100)*100-INT(I/Q10)*Q1
   0:? #Q3;CHR$(I1+176-128*PRT);
IQ 4420 ? #Q3;CHR$(160-128*PRT);:IF I<100
    THEN ? #Q3;CHR$(160-128*PRT);:IF I<Q1
   0 THEN ? #Q3;CHR$(160-128*PRT);
DW 4430 NEXT I:? #Q3;CHR$(160-128*PRT);:I
   F PRT THEN ? #Q3;" "
HD 4440 IF  NOT PRT THEN 4480
RJ 4450 ? #Q3;"--- ";
YZ 4460 TEMP$(Q1)="-":TEMP$(24)="-":TEMP$
   (Q2)=TEMP$:? #Q3;TEMP$;" ";
GT 4470 TEMP$(Q1)="-":TEMP$(RW-32)="-":TE
   MP$(Q2)=TEMP$:? #Q3;TEMP$
GA 4480 BOT=OFFSET+12
YH 4490 IF LAST<OFFSET+12 THEN BOT=LAST
IG 4500 IF PRT THEN BOT=LAST
AT 4510 FOR I=OFFSET TO BOT
SI 4520 MASK$=".    ":MASK$(129)=".    ":MA
   SK$(5)=MASK$
ML 4530 ? #Q3;A(I,Q0);" ";
ZA 4540 IF A(I,Q0)<100 THEN ? #Q3;" ";:IF
    A(I,Q0)<Q10 THEN ? #Q3;" ";
QU 4550 ? #Q3;PROJECT$(I*25+Q1,I*25+Q10+1
   5*PRT);" ";
RA 4560 ID=A(I,Q0):START=A(I,Q1):DUR=A(I,
   Q2):ES=A(I,Q3):LC=A(I,Q4)
VL 4570 SCR=SCL+Q7+PRT*(Q6+13*SMALL)
FN 4580 IF ES>=SCR OR ES+DUR<=SCL THEN 47
   10
FK 4590 IF DUR=Q0 THEN MASK$((ES-SCL)*Q4+
   Q1,(ES-SCL)*Q4+Q1)=CHR$(42):GOTO 4710
PG 4600 T1=SCL:IF ES>SCL THEN T1=ES
VB 4610 T2=SCR:IF SCR>ES+DUR THEN T2=ES+D
   UR
JW 4620 FOR J=T1-SCL TO T2-SCL-Q1
DE 4630 FOR K=Q1 TO Q4
IR 4640 MASK$((J*Q4)+K,(J*Q4)+K)=CHR$(88-
   26*(LC>ES)):NEXT K:NEXT J
CZ 4650 IF LC<=ES THEN 4710
PG 4660 T1=SCL:IF ES+DUR>SCL THEN T1=ES+D
   UR
BM 4670 T2=SCR:IF SCR>LC+DUR THEN T2=LC+D
   UR
KO 4680 FOR J=T1-SCL TO T2-SCL-Q1
DW 4690 FOR K=Q1 TO Q4
FD 4700 MASK$((J*Q4)+K,(J*Q4)+K)=CHR$(45)
   :NEXT K:NEXT J
AQ 4710 ? #Q3;MASK$(Q1,25+PRT*(24+52*SMAL
   L));:IF PRT THEN ? #Q3;" "
FM 4720 NEXT I
EK 4730 IF PRT THEN 4820
SS 4740 MASK$=".    ":MASK$(129)=".    ":MA
   SK$(5)=MASK$
JU 4750 IF LAST+Q1>OFFSET+12 THEN 4800
VQ 4760 FOR I=LAST+Q1 TO OFFSET+12
HO 4770 ? #Q3;SPACE$(Q1,15+14*PRT);
OU 4780 ? #Q3;MASK$(Q1,25);
GH 4790 NEXT I
IN 4800 POSITION 17,23:? "     ";
NP 4810 IF  NOT CALC THEN POSITION 17,23:
   ? "■CALC■";
AY 4820 RETURN
JZ 4830 Q1=1:Q2=Q1+Q1:Q3=Q1+Q2:Q4=Q1+Q3:Q
   5=Q1+Q4:Q6=Q1+Q5:Q7=Q1+Q6:Q8=Q1+Q7:Q9=
   Q1+Q8:Q10=Q1+Q9
RF 4840 CLOSE #Q3:OPEN #Q3,Q8,Q0,"S:"
WW 4845 BRK=(PEEK(53279)<>5)
PL 4850 POKE 710,Q0:POKE 712,148:POKE 752
   ,Q1:POKE 709,Q0
ES 4860 DIM LOGO$(75):LOGO$="□□□□□□□□□□□□↓←←
   ←←←←←←←←□■▬■roject□↓←←←←←←←←←←←←←←□■▬■lan
   ner□↓←←←←←←←←←←←←□□□□□□□□□□□□□□"
DR 4870 POSITION 14,Q3:? "Intializing":PO
   SITION 14,Q5:? "Step 1 of 3":POSITION
   15,Q9:? LOGO$
ZE 4880 POSITION 11,18:? "by David Schwen
   er":POKE 709,Q10:OFFSET=Q1:PAGE=Q1
UP 4890 DIM A(50,Q9),PROJECT$(1275),B(Q4)
JX 4900 DIM DATE1$(500),DATE2$(500)
AM 4910 DIM FIELD$(25),LEFT$(25),G$(25),W
   EEKDAY$(63),DATE$(8),MOVE$(39),MONTH$(
   36),FNAME$(17),TNAME$(25)
VZ 4920 DIM TEMP$(150),TEMP1$(150),BLANK$
   (250),BORDER$(40),BORDER1$(40),SCALE$(
   15)
EL 4930 DIM SPACE$(250),MASK$(132)
JI 4940 DIM INFO$(78),INFO1$(78),GANTT$(3
   5),GANTT1$(35),WORK(Q6)
GS 4950 FIELD$=".":FIELD$(25)=".":FIELD$(
   2)=FIELD$
HF 4960 BORDER$="▭":BORDER$(40)="▭":BORDE
   R$(2)=BORDER$
AA 4970 BORDER1$="⊟":BORDER1$(40)="⊟":BOR
   DER1$(2)=BORDER1$
BH 4980 LEFT$="⊞":LEFT$(25)="⊞":LEFT$(2)=
   LEFT$
DW 4990 BLANK$="■":BLANK$(250)="■":BLANK$
   (2)=BLANK$
AQ 5000 SPACE$=" ":SPACE$(250)=" ":SPACE$
   (2)=SPACE$
JW 5010 PROJECT$=" ":PROJECT$(1000)=" ":P
   ROJECT$(2)=PROJECT$:WEEKDAY$=PROJECT$:
   G$=PROJECT$:TEMP$=PROJECT$
XL 5020 TEMP1$=PROJECT$:GOSUB 5300
TL 5030 SCALE$="DAY   WEEK MONTH"
II 5040 DATA Friday,Saturday,Sunday,Monda
   y,Tuesday,Wednesday,Thursday
PV 5050 FOR I=Q0 TO Q6:READ G$
CV 5060 WEEKDAY$(I*Q9+Q1,I*Q9+LEN(G$)+Q1)
   =G$:NEXT I
EH 5070 FOR I=Q3 TO Q6:WORK(I)=Q1:NEXT I:
   FOR I=Q1 TO Q2:WORK(I)=Q0:NEXT I:WORK(
   Q0)=Q1
LR 5100 MOVE$="hh■Wh■Uh■Yh■Xh■Zh■■■1VrXHP
   ■fWfYJPrFZ■n■"
ZP 5110 DATA Jan,Feb,Mar,Apr,May,Jun,Jul,
   Aug,Sep,Oct,Nov,Dec
XL 5120 POSITION 19,5:? "2"
PW 5130 FOR I=Q0 TO 11:READ G$
BD 5140 MONTH$(I*Q3+Q1,I*Q3+Q3)=G$:NEXT I
IH 5150 OPEN #Q1,Q4,Q0,"K:"
CZ 5160 TEMP$="PName Start Scale Wdays Ex
   it "
AM 5170 GOSUB 5230:INFO$=TEMP$:INFO1$=TEM
   P1$
LM 5180 TEMP$="Add  Ins  Chg  Del  Scr  C
   al  End "
OP 5190 GOSUB 5230:GANTT$=TEMP$:GANTT1$=T
   EMP1$
YE 5200 POSITION 19,5:? "3"
OO 5210 FOR I=Q0 TO 50:FOR J=Q0 TO Q9:A(I
   ,J)=Q0:NEXT J:NEXT I:A(Q0,Q0)=9999
TA 5220 GOTO 770
ZC 5230 FOR I=1 TO LEN(TEMP$)
LO 5240 TEMP1$(I,I)=CHR$(ASC(TEMP$(I,I))+
   128)
FM 5250 NEXT I
AZ 5260 RETURN
VV 5270 POKE 82,12:? :POSITION 12,15:WIDT
   H=15:LENGTH=Q4:CMD=Q0:GOSUB 690:POKE 8
   2,Q0
HW 5280 POSITION 14,16:? "ERROR■#■";PEEK(
   195):POSITION 13,17:? "Press■any■key"
MH 5290 GOSUB 390:OFFSET=Q1:SCL=Q0:GOTO 7
   70
IE 5300 IF BRK THEN POKE 16,112:POKE 5377
   4,112
AM 5310 RETURN
```

LISTING 2

```
SV 10 REM CRITICAL PATH PROJECT MANAGER,
   LISTING TWO
XR 20 REM BY DAVID SCHWENER
PT 30 REM (c)1987, ANTIC PUBLISHING
DB 35 REM (CREATES LINES 4860 AND 5100 FO
   R LISTING ONE.)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or ■assette?";:POKE 764,25
   5
```

continued on next page

```
PY  90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
    58) THEN 90
TH  100 IF PEEK(764)=18 THEN FN$="C:"
VB  110 POKE 764,255:GRAPHICS 0:? "      AN
    TIC'S GENERIC BASIC LOADER"
MY  120 ? ,"BY CHARLES JACKSON"
KB  130 POKE 10592,DPL:TRAP 200
PU  140 ? :? :? "Creating ";FN$:? "...plea
    se stand by."
LW  150 RESTORE :READ LN:LM=LN:DIM A$(LN):
    C=1
BQ  160 AR$="":READ AR$
YC  170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
    2,255
DM  180 LM=LM-1:POSITION 10,10:? "(Countdo
    wn...T-";INT(LM/10);")      "
BK  190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
    1:NEXT X:GOTO 160
MM  200 IF PEEK(195)=5 THEN ? :? :? "⊠TOO
    MANY DATA LINES!":? "CANNOT CREATE FIL
    E!":END
CM  210 IF C<LN+1 THEN ? :? "⊠TOO FEW DATA
     LINES!":? "CANNOT CREATE FILE!":END
UQ  220 IF FN$="C:" THEN ? :? " Prepare ca
    ssette, press [RETURN]"
AR  230 OPEN #1,8,0,FN$
PV  240 POKE 766,1:? #1;A$;:POKE 766,0
AL  250 CLOSE #1:GRAPHICS 0:? "█COMPLETED█
    "
IF  1000 DATA 155
EB  1010 DATA 052056054048032068073077032O
    7607907107903604005505304105807607907I
    0790360610340140140140I4014
UC  1020 DATA 014014014014029030030030030O
    300300300300300300020250211532422392 34
    229227244022029030030030030
DW  1030 DATA 030030030030030030030020250
    211402362252382382292420220290300300 30
    030030030030030030013013
LX  1040 DATA 013013013013013013034155O
    530490480480320770790860690360610341 04
    1041332151041332141041332 17
DU  1050 DATA 104133216104133218104170160 0
    001772141452162002080042302152302172 02
    208242198218016238096034155
GD  1060 DATA 014
```

say goodbye to cassette chaos

CASSETTE JACKETS

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LISTING 1

Don't type the TYPO II Codes!

```
HR  2 REM WYSIWYG
EW  4 REM BY CHET WALTERS
PU  6 REM (c)1986, ANTIC PUBLISHING
ID  10 GOTO 2000
TL  15 GET #2,K:P84=PEEK(84):P85=PEEK(85):
    IF K=19 THEN GOSUB 340:GOTO 15
DT  20 IF K=4 THEN GOSUB 480:GOTO 15
ZA  25 IF K=2 THEN GOSUB 430:GOTO 15
XR  30 IF K=3 THEN GOSUB 130:K=155
XH  35 IF K>253 OR K=156 OR K=157 OR K=125
     THEN IF PEEK(93)<>82 THEN GOSUB 130:G
    OTO 15
YB  40 IF K=27 THEN GOSUB 340:POKE 752,1:?
     "⊞";:GOTO 3000
CP  45 IF K=1 THEN POKE 85,1:? "⊞";:GOTO 1
    5
TR  50 IF K=26 THEN POKE 85,27:? "⊞";:GOTO
     15
HH  55 IF K=127 THEN IF PEEK(85)<23 THEN G
    OTO 115
EG  60 IF K=20 THEN A=B:P84=0:POKE 85,2:K=
    28:GOTO 110
OW  65 IF K=5 THEN POKE 84,22:K=155:POKE 7
    64,12:A=B+240:GOTO 95
MQ  70 IF K=155 AND P84<>23 THEN GOTO 95
UN  75 IF K>31 THEN IF PEEK(93)=82 THEN GO
    SUB 320:GOTO 15
CU  80 IF P84=23 AND K=29 THEN GOSUB 320:G
    OTO 15
XZ  85 IF K=6 THEN GOSUB 400:GOTO 15
IW  90 IF K<28 OR K>126 THEN GOSUB 320:GOT
    O 15
VN  95 IF P85=2 AND K=30 THEN POKE 85,27:G
    OTO 115
SZ  100 IF P85=26 AND K=31 THEN POKE 85,1
RB  105 IF P85=27 AND K<>155 AND K<>126 TH
    EN GOSUB 320:K=30
MF  110 IF P84=0 AND K=28 THEN A=A-40*(A<>
    B):GOSUB 300:POKE 84,0:? "⊞⊞";:GOTO 15
RA  115 ? CHR$(K);:IF PEEK(84)<>23 THEN GO
    TO 15
SB  120 IF A<B+280 THEN POKE 84,22:A=A+40:
    GOSUB 300
TM  125 GOTO 15:REM END EDITOR LOOP
QT  129 REM CENTER/INSERT/DELETE
BE  130 POKE 752,1:POKE 85,0:? "⊞";:J=A-B+
    P84*40+3:PBF$=E$(J,J+24):PSET$="██████
    ███████████████████":IF K>3 THEN 160
QN  140 FOR I=25 TO 1 STEP -1:IF PBF$(I,I)
    <>"█" THEN POP :X=INT(I/2):PSET$(13-X)
    =PBF$:GOTO 290
GB  150 NEXT I
CF  160 IF K<254 THEN 210
OS  170 Q=P85-1:POKE 85,Q:IF Q=26 THEN GOS
    UB 320:PSET$=PBF$:GOTO 290
MV  180 IF Q=25 THEN PSET$=PBF$:PSET$(25,2
    5)="█":POKE 85,25:GOTO 290
ET  190 IF K=255 THEN PSET$(1,Q)=PBF$:PSET
    $(Q+1,25)=PBF$(Q,25):PSET$(Q,Q)="█":GO
    TO 290
IC  200 PSET$(1,Q)=PBF$:PSET$(Q,Q+24)=PBF$
    (Q+1,25):GOTO 290
IO  210 IF K<156 THEN 290
JO  220 IF J=843 OR J=883 THEN GOSUB 320:P
    SET$=PBF$:GOTO 290
YP  230 PBF$=PSET$:PSET$=E$:X=J:Q=J+40:FOR
     I=J TO 1242 STEP 40:IF I=763 THEN Q=Q
    +160
NK  240 IF I=803 THEN J=J+160:I=I+160
MK  250 IF K=156 THEN E$(J,J+24)=PSET$(Q,Q
    +24)
VX  260 IF K=157 THEN PSET$(Q,Q+24)=E$(J,J
    +24)
TJ  270 J=J+40:Q=Q+40:NEXT I:PSET$(J)=PBF$
    :IF K=157 THEN E$=PSET$:J=X
QH  280 PSET$=PBF$
GY  290 E$(J,J+24)=PSET$:POKE 752,0:? "⊞";
    :RETURN
EZ  299 REM SCROLL EDITOR
VJ  300 AHI=INT(A/256):ALO=A-AHI*256:POKE
    DL,ALO:POKE DL+1,AHI:POKE 88,ALO:POKE
    89,AHI:RETURN
GK  319 REM SIGNAL - CAN'T TYPE
LE  320 POKE 712,50:POKE 53247,50:FOR I=1
    TO 5:NEXT I:POKE 694,0:POKE 712,0:RETU
    RN
GE  339 REM FLIP SIDES
DX  340 J=PEEK(85):POKE 85,0:POKE 752,1:?
    "⊞";:IF  NOT SIDE THEN A$=E$:POKE 710,
    140
BY  350 IF SIDE THEN B$=E$:POKE 710,124
SW  360 E$=A$:SIDE=(SIDE=0):IF SIDE THEN E
    $=B$
AI  370 POKE 85,J+1:POKE 752,0:? "⊞";:POKE
     709,0:RETURN
TE  399 REM TOGGLE C-SET
MS  400 IF PEEK(756)=224 THEN POKE 756,CHS
    ET/256:RETURN
VK  410 POKE 756,224:RETURN
VN  429 REM TOGGLE BIAS
WE  430 BIAS=(BIAS+1)*(BIAS<2):IF BIAS=0 T
    HEN E$(478,479)="./"
IS  440 IF BIAS=1 THEN E$(478,479)="#r"
SX  450 IF BIAS=2 THEN E$(478,479)="-4"
ZM  460 RETURN
MS  479 REM TOGGLE DOLBY
SA  480 DB=(DB+1)*(DB<3):E$(439,439)=CHR$(
    34+(DB=2)+6*(DB=3)+12*(DB=0)):RETURN
PD  499 REM MAKE NEW JACKET FORM
ZR  500 E$="♡":E$(1300)=E$:E$(2)=E$:A=ADR(
    E$):B=A:POKE 752,1:POKE 709,0:POKE 710
    ,124:SIDE=0:POKE 756,CHSET/256
LG  510 ? "⇧▨▨▨▨▨ WIPING JACKET FORM ▨▨▨▨▨
    ";:J=1:FOR I=1 TO 1279 STEP 40:PBF$="
     ":PBF$(1+(J<10),2)=STR$(J)
AH  520 FOR Q=1 TO 2:PBF$(Q,Q)=CHR$(ASC(PB
    F$(Q,Q))+96):NEXT Q:X=USR(ROTCHAR,CHSE
    T+104,3)
```

```
VO 540 E$(I,I+1)=PBF$:J=J+(I<761 OR I>920
   ):E$(I+2,I+26)="▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼
   ▼▼▼▼▼":NEXT I:GOSUB 300
PG 550 POKE 82,0:POKE 84,19:? :? "■■══════
   ══════════════════════■■■■■■■■■■■■":? "■
   ▶":? "■▶"
ID 560 ? "■■══════════════════════════■■■■
   ■■■■■■■■";:POKE 82,27:POKE 84,20:? :?
   "◄■■■TITLE":? "◄■GOES HERE"
KW 570 RESTORE 570:FOR I=0 TO 19:READ PBF
   $:POSITION 28,I:? PBF$;:NEXT I:DB=1:BI
   AS=1
NU 580 DATA ■▶SIDE A◄■,,CONTROL,■T■▶TOF,■
   E■▶EOF,■A■▶BOL,■Z■▶EOL,■F■▶FONT,■S■▶SI
   DE,■C■▶CENTER
JA 590 DATA ■D■▶DOLBY■B,■B■▶BIAS■Cr,,SHIF
   T/CLEAR,ERASE■LINE,,  ESC FOR  , MAIN
   MENU ,,■▶SIDE A◄■
HT 600 POKE 82,2:A$=E$:B$=E$:POKE 752,0:P
   OKE 764,173
MI 610 B$(31,36)="3▶S▒♥■":B$(791,796)=B$(
   31,36):RETURN
NE 999 REM PRINT JACKET
IG 1000 POKE 756,CHSET/256:POSITION 2,19:
   ? "USE■DISPLAYED■FONT■TO■PRINT■Y■";:GE
   T #2,K:IF K=78 THEN POKE 756,224
XN 1010 POSITION 2,19:? "■PREPARE■PRINTER
   ■AND■PRESS■ANY■KEY■":POKE 752,1:? ,"ES
   CAPE TO ABORT"
WI 1020 I=USR(MV,PEEK(756)*256,ADR(PSET$)
   ,1024):FOR J=0 TO 2*(TOPWIRE=128):I=US
   R(ROTCHAR,ADR(PSET$),128):NEXT J
GO 1030 GET #2,K:IF K=27 THEN 3000
MG 1040 TRAP 1010:CLOSE #1:OPEN #1,8,0,"P
   :":POSITION 1,19:? "■":TRAP 3000
WA 1050 CHAR=255:GOSUB 1400:GOSUB 1600:CH
   AR=0:GOSUB 1200:E$(2,8)="3▶S▒♥■♥":E$(5
   3,59)="♥3▶S▒♥■":E$(12,18)=A$(433,439)
GU 1060 E$(21,27)=A$(473,479):E$(34,40)=B
   $(433,439):E$(43,49)=B$(473,479):E$(17
   ,17)="■":E$(25,25)="■"
IC 1070 E$(39,39)="■":E$(47,47)="■":GOSUB
    1400:GOSUB 1500:GOSUB 1600
ZO 1080 CHAR=0:GOSUB 1400:GOSUB 1700:GOSU
   B 1600
HO 1090 FOR JKT=0 TO 19:GOSUB 1200:GOSUB
   1300:GOSUB 1400:GOSUB 1500:GOSUB 1600:
   NEXT JKT
VK 1100 CHAR=(TOPWIRE=1)+3+188*(TOPWIRE=1
   ):GOSUB 1400:GOSUB 1700:GOSUB 1600
YV 1110 CHAR=0:GOSUB 1400:GOSUB 1700:GOSU
   B 1600
PV 1120 FOR JKT=21 TO 22:GOSUB 1200:GOSUB
    1300:GOSUB 1400:GOSUB 1500:GOSUB 1600
   :NEXT JKT
ZB 1130 CHAR=0:GOSUB 1400:GOSUB 1700:GOSU
   B 1600
XQ 1140 CHAR=24:GOSUB 1400:GOSUB 1700:GOS
   UB 1600
RB 1150 FOR JKT=24 TO 30:GOSUB 1200:GOSUB
    1300:GOSUB 1400:GOSUB 1500:GOSUB 1600
   :NEXT JKT
UA 1160 CHAR=255:GOSUB 1400:GOSUB 1600:?
   #1:CLOSE #1:GOTO 3000
ZL 1200 E$="■":E$(59)=E$:E$(2)=E$:E$(1,1)
   ="■":E$(30,30)="■":E$(60,60)="■":RETUR
   N
LL 1300 E$(4,28)=A$(40*JKT+3,40*JKT+27):E
   $(33,57)=B$(40*JKT+3,40*JKT+27):RETURN
UT 1400 PBF$=CHR$(CHAR):PBF$(479)=PBF$:PB
   F$(2)=PBF$:RETURN
KZ 1500 PBF=ADR(PBF$):FOR X=1 TO 60:INV=0
   :C=ASC(E$(X,X)):IF C>127 THEN C=C-128:
   INV=255
JY 1510 I=USR(EOR,PBF,ADR(PSET$)+8*C,INV)
   :PBF=PBF+8:NEXT X:RETURN
ZU 1600 I=USR(NCR,ADR(PBF$),480,155):? #1
   ;P$;PBF$:IF PEEK(764)=28 THEN POP :POK
   E 764,255:? #1:CLOSE #1:GOTO 3000
AO 1610 RETURN
GG 1700 FOR I=1 TO 8:PBF$(I,I)=CHR$(255):
   NEXT I:PBF$(473,480)=PBF$(1,8):PBF$(23
   6,237)=PBF$(1,2):RETURN
KN 1999 REM INITS. & CHOOSE PRINTER
EU 2000 GRAPHICS 0:POKE 731,255:DL=PEEK(5
   60)+256*PEEK(561)+4:CHSET=(PEEK(89)-8)
   *256:OPEN #3,12,0,"E:"
HW 2010 OPEN #2,4,0,"K:":DIM A$(1300),B$(
   1300),E$(1300),PBF$(500),PSET$(1400),C
   IO$(30),MV$(57),R$(96),F$(30),P$(20)
SB 2020 DIM EOR$(45),NCR$(60),JKT$(14):GO
   SUB 9000:GOSUB 5000:I=USR(MV,57344,CHS
   ET,1024):JKT$="NONE"
SK 2030 POKE 710,146:? "■":RESTORE 2040:P
   RNTRS=2:FOR I=1 TO PRNTRS:READ P$:? I;
   "->";P$:? :NEXT I
JV 2040 DATA EPSON,PROWRITER
CF 2041 REM ------------------------------
UB 2042 REM TO ADD PRINTERS TO THE ABOVE
   LIST, CHANGE THE >PRNTRS=2< IN 2030
   TO THE # OF PRINTERS ON
RZ 2044 REM YOUR LIST, AND ADD THE NAMES
   TO THE ABOVE DATA STATEMENTS.  THEN
   ADD DATA STATEMENTS NUMBERED
NE 2045 REM BY ONES) AFTER 2102 WITH THE
   APPROPRIATE PRINTER CONTROL CODES
VI 2046 REM (IN DECIMAL).
DD 2047 REM ------------------------------
UT 2050 ? "CHOOSE PRINTER->";:GET #2,K:K=
   K-48:P$="":J=1:RESTORE 2100+K:IF K<1 O
   R K>PRNTRS THEN 2030
SN 2060 READ A:IF A<0 THEN TOPWIRE=ABS(A)
   :GOSUB 5000:GOTO 3000
IJ 2070 P$(J,J)=CHR$(A):J=J+1:GOTO 2060
DW 2098 REM ------------------------------
FD 2099 REM LINEFEED=8 DOTS, HI-RES
   GRAPHICS=480 BYTE/LINE & USE NEGATIVE
   MSB OR LSB FOR TOP WIRE
BR 2100 REM ------------------------------
BZ 2101 DATA 27,65,8,27,76,224,1,-128
UO 2102 DATA 27,62,27,84,49,54,27,81,27,8
   3,48,52,56,48,-1
BW 2999 REM MAIN MENU
FW 3000 TRAP 3000:CLOSE #1:GRAPHICS 0:POK
   E 710,0:POKE 756,CHSET/256:POKE 82,4:P
   OKE 702,64:POKE 16,64:POKE 53774,64
LA 3010 RESTORE 3000:FOR I=1 TO 10:READ P
   SET$:? PSET$:? :NEXT I:POKE 82,2:?
CS 3020 DATA ,     ■WYSIWYG!■CASSETTE■JACKET
   S■,          ↑by Chet Walters
MX 3030 DATA ,C-> CREATE NEW JACKET,E-> E
   DIT,S-> SAVE JACKET,L-> LOAD JACKET,P-
   > PRINT JACKET,F-> LOAD FONT
KO 3040 POSITION 13,9:? JKT$:POSITION 2,2
   0:? "↑↑↑↑■CHOICE■▶";:GET #2,K:IF K=96
   THEN I=USR(MV,57344,CHSET,1024)
PB 3050 IF JKT$="NONE" THEN IF K=69 OR K=
   83 OR K=80 THEN GOSUB 320:GOTO 3040
UK 3100 IF K=67 THEN I=7:GOSUB 4400:GOSUB
    4000:JKT$="JACKET":GOSUB 500:GOTO 15
UL 3200 IF K=69 THEN J=32:A=B:SIDE=(SIDE=
   0):GOSUB 360:GOSUB 340:GOSUB 300:POKE
   764,173:GOTO 15
VY 3300 IF K<>83 THEN 3400
XE 3310 I=11:GOSUB 4400:GOSUB 4100:TRAP 3
   000:GOSUB 4300:OPEN #1,8,0,F$:? #1;"JA
   CKET"
IX 3320 I=USR(CIO,16,11,ADR(A$),1300):I=U
   SR(CIO,16,11,ADR(B$),1300):CLOSE #1:JK
   T$=F$(4):GOTO 3000
XW 3400 IF K<>76 THEN 3500
WA 3410 I=13:GOSUB 4400:GOSUB 4000:GOSUB
   4100:GOSUB 4300:TRAP 3000:OPEN #1,4,0,
   F$:? "■■■■■■■■";
WI 3420 INPUT #1;PBF$:IF PBF$<>"JACKET" T
   HEN GOTO 3000
WR 3430 GOSUB 500:I=USR(CIO,16,7,ADR(A$),
   1300):I=USR(CIO,16,7,ADR(B$),1300):JKT
   $=F$(4):E$=A$:GOTO 15
VR 3500 IF K=80 THEN I=15:GOSUB 4400:GOTO
    1000
NQ 3600 IF K<>70 THEN GOSUB 320:GOTO 3040
CY 3610 I=17:GOSUB 4400:GOSUB 4100:OPEN #
   1,4,0,F$:POKE 756,CHSET/256:I=USR(CIO,
   16,7,CHSET,1024):CLOSE #1:GOTO 3000
MS 4000 IF JKT$="NONE" THEN RETURN
VJ 4010 ? "WIPE■CURRENT■FORM? N■";:GET #2
   ,K:IF K<>89 THEN POP :GOTO 3000
AI 4020 RETURN
HW 4100 POSITION 2,20:? "■RETURN=MENU■■■1
   9=DIRECTORY■":? "ENTER■FILENAME■▶";
ZZ 4110 INPUT #3;PBF$:IF PBF$="" THEN POP
    :GOTO 3000
NT 4120 IF PBF$>"0" AND PBF$<":" THEN GOS
   UB 4200:GOTO 4100
KL 4125 FOR I=1 TO LEN(PBF$):IF PBF$(I,I)
   =":" THEN F$=PBF$:POP :GOTO 4140
RZ 4130 NEXT I:F$="D1:":F$(4)=PBF$
AQ 4140 RETURN
HX 4200 POKE 82,0:? "■";:F$="D":F$(2)=PBF
   $:F$(3)=":*.*":? F$(1,3):TRAP 4230:CLO
   SE #1:OPEN #1,6,0,F$:TRAP 4220
FI 4210 INPUT #1;F$:? F$,:GOTO 4210
QE 4220 TRAP 4220:CLOSE #1
```

continued on next page

```
WP 4230 POKE 82,2:? :RETURN
MM 4300 F$(LEN(F$)+1)=".JKT":? F$;:RETURN

TJ 4400 POSITION 5,I:? "■■▶":POKE 84,20:?
      "■";:RETURN
UO 5000 NCR$="hh■0h■Nh■Mh■Lh■Kh■P1NEPP■■■■
   ■■■■■■■N■■Ni■■N■0i■■0FLP■FM■Y■":NCR=A
   DR(NCR$)
WI 5010 MV$="hh■Lh■Kh■Nh■Mh■Ph■0■■&PP■1K■
   M■PyfLfNJPrS0P■■1K■M■Py1K■M■":MV=ADR(M
   V$)
QZ 5020 CIO$="hhh■hh■B■h■E■h■D■h■I■h■H■LV
   ■":CIO=ADR(CIO$)
PR 5030 R$="hh■Mh■Lhh■N■■■P■■■■■■■0■■■Q1L
   %PP■■Q■0■0■F■Po■0■RJ■PP■■■■■5R■L■J■X■■
   ■eL■L■■eM■MFNP9■":ROTCHAR=ADR(R$)
ZU 5040 EOR=ADR(EOR$):IF TOPWIRE=1 THEN E
   OR$="hh■Mh■Lh■0h■Nhh■P■■1NEP■L■■W■":RE
   TURN
XZ 5050 EOR$="hh■Mh■Lh■0h■Nh■Qh■P■■■RSQ1N
   EPSR■LfQFR■■O■":RETURN
EH 9000 VNTP=PEEK(130)+PEEK(131)*256
NR 9001 VVTP=PEEK(134)+PEEK(135)*256
DX 9003 SWAP=1
WX 9004 IF INT(ADR(A$)/2048)=INT((959+ADR
   (A$))/2048) THEN SWAP=65
BQ 9005 IF INT(ADR(B$)/2048)=INT((959+ADR
   (B$))/2048) THEN SWAP=66
JY 9006 IF SWAP=1 THEN 9039
MI 9007 POKE 710,0
OP 9010 X=1:OFFSET=0:A=0:B=0
RR 9015 IF PEEK(X+VNTP-1)<128 THEN 9030
YQ 9016 OFFSET=OFFSET+1
LH 9020 IF A=0 AND PEEK(X+VNTP)=69 AND PE
   EK(X+VNTP+1)=164 THEN A=OFFSET:X=X+1
JF 9025 IF B=0 AND PEEK(X+VNTP)=SWAP AND
   PEEK(X+VNTP+1)=164 THEN B=OFFSET:X=X+1

DI 9030 IF X<100 THEN X=X+1:GOTO 9015
IR 9031 REM
XS 9032 TEMPA=PEEK(VVTP+(A*8)+2):TEMPB=PE
   EK(VVTP+(A*8)+3)
HE 9033 POKE VVTP+(A*8)+2,PEEK((VVTP+(B*8
   )+2)):POKE VVTP+(A*8)+3,PEEK((VVTP+(B*
   8)+3))
MQ 9034 POKE VVTP+(B*8)+2,TEMPA:POKE VVTP
   +(B*8)+3,TEMPB
CA 9039 RETURN
```

LISTING 2

```
CN 10 REM WYSIWYG, LISTING TWO
IJ 20 REM BY CHET WALTERS
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
ML 35 REM (CREATES LINES 5000 - 5050 FOR
   LISTING ONE.)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")     "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "■TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "■TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
JX 1000 DATA 474
EJ 1010 DATA 0530480480480320780670820360
   61034104104133207104133206104133205104
   133204104168104133208177206
SP 1020 DATA 1972082080041691542080062010
   13208002169012145206024165206105001133
   206165207105000133207198204
UP 1030 DATA 2082211982050162170960340580
   78067082061065068082040078067082036041
   155053048049048032077086036
DM 1040 DATA 0610341041041332041041332031
   04133206104133205104133208104133207160
   000166208240014177203145205
IF 1050 DATA 1362082492302042302062022082
   42164207240012136177203145205136208249
   177203145205096034058077086
JS 1060 DATA 0610650680820400770860360411
   55053048050048032067073079036061034104
   104104170104104157066003104
MB 1070 DATA 1570690031041570680031041570
   73003104157072003076086228034058067073
   079061065068082040067073079
GQ 1080 DATA 0360411550530480510480320820
   36061034104104133205104133204104104133
   206169001133208162007160007
NR 1090 DATA 1690001332071691281332091772
   04037208240006165209005207133207136070
   209208239165207149210202006
XK 1100 DATA 2082082201620071600071812101
   45204136202016248169008024101204133204
   169000101205133205198206208
FU 1110 DATA 1850960340580820790840670720
   65082061065068082040082036041155053048
   052048032069079082061065068
GD 1120 DATA 0820400690790820360410580730
   70032084079080087073082069061049032084
   072069078032069079082036061
BF 1130 DATA 0341041041332051041332041041
   33207104133206104104133208160007177206
   069208145204136016247096034
FI 1140 DATA 0580820690840850820780321550
   53048053048032069079082036061034104104
   133205104133204104133207104
LW 1150 DATA 1332061041332091041332081600
   07132210164209177206069208164210145204
   230209198210136016239096034
GK 1160 DATA 058082069084085082078032155
```

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BIBLIOGRAPHY MASTER

Article on page 40

LISTING 1

Don't type the TYPO II Codes!

```
XI 10 REM BIBLIOGRAPHY WRITER
DJ 20 REM BY ALFRED FILSKOV
PT 30 REM (c)1987, ANTIC PUBLISHING
BG 40 READ F0,F1,F2,F3,F4,F5,F6,F7,F8,F9,
   F10,F82,F249,F250
BW 50 DATA 0,1,2,3,4,5,6,7,8,9,10,82,249,
   250
VR 60 DIM A$(F250),B$(F250),C$(F5),IN$(10
   0),US$(F3),UC$(F3),Q$(F1),BK$(F250),CL
   $(F1),INV$(F1)
FY 70 GRAPHICS F0:WAIT=F0:MAX=INT(FRE(F0)
   /F250-F8):DIM J$(MAX*F250)
TU 80 INV$="■":Q$=CHR$(34):CL$="■":BK$="
   ":BK$(F250)=" ":BK$(F2)=BK$
BN 84 REM
ZY 85 REM US$=EPSON CONTROL CODES TO
      START UNDERLINING.
WO 86 REM UC$=EPSON CONTROL CODES TO
      END UNDERLINING.
PU 90 US$="■-1":UC$="■-0"
```

```
FB 100 OPEN #F1,F4,F0,"K:":POKE 83,39
HU 110 REM MAIN MENU
TU 120 POKE 764,255:IF WAIT THEN ? :? "Pr
   ess RETURN":INPUT #16;A$:POKE 767,F0:W
   AIT=F0
JG 130 POKE 710,56:POKE 709,F0:POKE 752,F
   0:POKE F82,15
BG 140 ? CL$:? "MAIN MENU":? "==== ====":
   POKE F82,F4
FW 150 ? :? "1. Erase the current biblios
   raphy":? "2. Save the current bibliogr
   aphy"
FK 160 ? "3. Load a bibliography":? "4. D
   elete a file"
WC 170 ? "5. Disk directory":? "6. Print
   preview the bibliography"
NN 180 ? "7. Print the bibliography":? "8
   . Store to word processor file"
CX 190 ? "9. End program":GOSUB 2470
GW 200 IF ((A=F1 OR A=F2 OR A=F6 OR A=F7
   OR A=F8) AND  NOT AMT) OR A<F1 OR A>F9
    THEN 120
TU 210 ON A GOSUB 270,300,350,400,440,490
   ,520,640,240
MH 220 GOTO 120
AZ 230 REM QUIT
FM 240 ? "End program...":GOSUB 2570:IF Y
   ES THEN GRAPHICS F0:END
ZI 250 RETURN
AO 260 REM ERASE
AQ 270 ? "Erase current bibliography...":
   GOSUB 2570:IF YES THEN AMT=F0
ZO 280 RETURN
TA 290 REM SAVE
UM 300 ? "What do you want to name this f
   ile?":GOSUB 2610:IF WAIT THEN RETURN
KP 310 OPEN #F2,F8,F0,A$:? "Saving..."
BM 320 FOR A=F1 TO AMT:? #F2;J$(A*F250-F2
   49,A*F250):NEXT A
KP 330 CLOSE #F2:RETURN
MH 340 REM LOAD
PC 350 ? "What is the name of the file to
    load?":GOSUB 2610:IF WAIT THEN RETURN

GY 360 OPEN #F2,F4,F0,A$:? "Loading...":A
   MT=F0:TRAP 380
TE 370 INPUT #F2,A$:AMT=AMT+F1:J$(AMT*F25
   0-F249)=A$:IF AMT<MAX THEN 370
KZ 380 CLOSE #F2:RETURN
MI 390 REM DELETE
GE 400 ? "Which file do you want to delet
   e?":GOSUB 2610:IF WAIT THEN RETURN
TD 410 GOSUB 2570:IF NO THEN RETURN
WX 420 OPEN #F2,F4,F0,A$:? "Erasing...":X
   IO 33,#F2,F0,F0,A$:CLOSE #F2:RETURN
NU 430 REM DIRECTORY
HS 440 ? "Disk directory:":? :TRAP 2830
HG 450 OPEN #F2,F6,F0,"D:*.*"
GF 460 INPUT #F2,A$:? A$;"   ";:IF A$(F5,F
   8)="FREE" THEN CLOSE #F2:? :WAIT=F1:RE
   TURN
PP 470 GOTO 460
SJ 480 REM PRINT PREVIEW
ZS 490 TYPE=F1:POKE 752,F1:LM=F1:RM=36
YO 500 ? "Press SPACE to pause, ESC to ex
   it.":? :GOTO 680
MR 510 REM PRINT
NS 520 TYPE=F2:LIN=F1:? "Turn the printer
    on and position the  paper."
BY 530 ? :? "If you want any control code
   s sent to the printer, type them and p
   ress"
LW 540 ? "RETURN.  If not, just press RET
   URN.":INPUT A$
FJ 550 LM=F10:RM=70
NY 560 TRAP 2840:CLOSE #F3:OPEN #F3,F8,F0
   ,"P:":? #F3;A$:LIN=LIN+F1
WU 570 FOR A=F1 TO F10:? #F3:LIN=LIN+F1:N
   EXT A
LX 580 ? :? "If you want 'Bibliography' a
   s the      title, just press RETURN.  I
   f you"
UV 590 ? "want a different title, type it
    and     press RETURN."
SD 600 POKE 702,F0:GOSUB 2670:IF IN$="" T
   HEN IN$="Bibliography"
IR 610 ? #F3;BK$(F1,INT((RM+LM)/F2-LEN(IN
   $)/F2));IN$:? #F3:? #F3:? #F3:LIN=LIN+
   F4
GM 620 ? "Printing...":GOTO 680
GC 630 REM STORE TO A DISK FILE
KZ 640 TYPE=F3:? "What do you want to nam
   e the word      processor file?":GOSUB
    2610
XL 650 IF WAIT THEN RETURN
GB 660 OPEN #F3,F8,F0,A$:? "Storing the f
   ile...":LM=F1:RM=59
LP 670 REM PRINT BIBLIOGRAPHY
FQ 680 TRAP 2850:CNT=F0
WO 690 CNT=CNT+F1:LNTH=F250:STRT=F1:B$=J$
   (CNT*F250-F249)
MT 700 IF B$(LNTH-F9,LNTH)=BK$(F1,F10) TH
   EN LNTH=LNTH-F10:GOTO 700
PV 710 IF B$(LNTH,LNTH)=" " THEN LNTH=LNT
   H-F1:GOTO 710
EC 720 STP=STRT+RM+F1-LM-F5*(STRT<>F1):IF
    STP>LNTH THEN STP=LNTH+F1
NO 730 IF B$(STP,STP)=" " OR B$(STP,STP)=
   INV$ THEN 760
QM 740 STP=STP-F1:IF STP<=STRT THEN STP=S
   TRT+RM-LM-F5*(STRT<>F1):GOTO 760
PL 750 GOTO 730
KZ 760 A$=B$(STRT,STP)
SB 770 IF A$(F1,F1)=" " OR A$(F1,F1)=INV$
    THEN A$=A$(F2):GOTO 770
KJ 780 IF A$(LEN(A$))=" " OR A$(LEN(A$))=
   INV$ THEN A$=A$(F1,LEN(A$)-F1):GOTO 78
   0
XG 790 ON TYPE GOTO 860,960,1180
IE 800 IF STP<LNTH THEN STRT=STP+F1:GOTO
   720
FE 810 IF CNT<AMT THEN 690
SZ 820 IF TYPE=F1 THEN WAIT=F1
NZ 830 IF TYPE=F2 THEN FOR A=LIN TO 66:?
   #F3:NEXT A
LJ 840 CLOSE #F3:RETURN
CI 850 REM DISPLAY THE LINE
VN 860 IF STRT=F1 THEN ? :? "<SOURCE #";C
   NT;">":GOTO 880
ZV 870 ? "     ";
NA 880 ? A$
EA 890 IF PEEK(764)=28 THEN RETURN
JO 900 IF PEEK(764)<>33 THEN 800
JA 910 ? "<PAUSED--PRESS SPACE>":POKE 764
   ,255
DN 920 IF PEEK(764)=28 THEN RETURN
MZ 930 IF PEEK(764)<>33 THEN 920
VF 940 POKE 764,255:GOTO 800
HM 950 REM PRINT THE LINE
EB 960 UND=F0:? #F3;BK$(F1,LM+F5*(STRT<>F
   1));
LR 970 FOR A=F1 TO LEN(A$)
HB 980 B=ASC(A$(A,A))
GV 990 IF B<128 AND UND THEN ? #F3;UC$;:U
   ND=F0
CC 1000 IF B>=128 AND  NOT UND THEN ? #F3
   ;US$;:UND=F1
AG 1010 ? #F3;CHR$(B-128*(B>=128));
BL 1020 NEXT A
QZ 1030 IF UND THEN ? #F3;UC$;
WL 1040 ? #F3:? #F3:LIN=LIN+F2
EJ 1050 IF LIN<59 OR (CNT=AMT AND STP>=LN
   TH) THEN 800
AQ 1060 FOR A=LIN TO 71:? #F3:NEXT A:LIN=
   F6
BA 1070 ? CL$:? "If you are using single
   sheets,"
LM 1080 ? "insert a new sheet of paper so
    that"
AW 1090 ? "the print head is 1 inch below
    the      top of the page."
VY 1100 ? :? "Press RETURN for any of the
    following that are not necessary:"
SD 1110 ? :? "What page is this";:GOSUB 1
   150
WD 1120 ? "What is your name";:GOSUB 1150
MP 1130 ? "What class is this for";:GOSUB
    1150
BW 1140 ? "Printing...":FOR A=F1 TO F3:?
   #F3:LIN=LIN+F1:NEXT A:GOTO 800
XD 1150 GOSUB 2670:IF IN$<>"" THEN ? #F3;
   BK$(F1,RM-LEN(IN$)-F2);IN$:LIN=LIN+F1
AT 1160 RETURN
PI 1170 REM STORE LINE IN DISK FILE
ME 1180 IF STRT>F1 THEN ? #F3;"     ";
UN 1190 ? #F3;A$
PV 1200 GOTO 800
RN 1210 REM ENTRY MENU
SV 1220 POKE 710,232:POKE F82,14:? CL$:?
   "ENTRY MENU":? "===== ===="
MT 1230 POKE F82,F3:? :? "Which resource
   is source #";AMT+F1;" from?"
OI 1240 POKE F82,F10:? :? "1. Book":? "2.
    Encyclopedia":? "3. Magazine":? "4. N
   ewspaper"
UH 1250 ? "5. Personal interview":? "6. N
   one-Compose your own"
```

continued on next page

```
FE  1260 GOSUB 2470:POKE 702,F6
FV  1270 IF A<F1 OR A>F6 THEN 1220
YJ  1280 IF AMT=MAX THEN ? "Not enough mem
    ory!":WAIT=F1:GOTO 120
GC  1290 B$="":? CL$
GK  1300 IF A=F6 THEN 1950
CB  1310 RESTORE 1320:FOR B=F1 TO A:READ A
    $:NEXT B
UG  1320 DATA Book,Encyclopedia,Magazine,N
    ewspaper,Interview
TW  1330 ? BK$(F1,17-LEN(A$)/F2);A$:?
KI  1340 READ B$:IF B$<>A$ THEN 1340
YY  1350 A$="":DEP=F0
TN  1360 READ TYPE:ON TYPE GOTO 1380,1420,
    1460,1510,1550,1590,1590,1720
SS  1370 REM REGULAR ENTRY
IW  1380 READ B$:? B$;"?"
BW  1390 GOSUB 2670:IF IN$="" THEN 1390
LA  1400 DEP=F0:GOTO 1690
OV  1410 REM SUPERFLUOUS ENTRY
TH  1420 READ B$:? B$;"?":? "  (Entry is n
    ot necessary)"
HW  1430 GOSUB 2670:DEP=F0:IF IN$="" THEN
    DEP=F1:GOTO 1360
UP  1440 GOTO 1690
QR  1450 REM DEPENDENT ENTRY
LM  1460 READ B$:IF DEP THEN 1360
VR  1470 ? B$;"?":? "  (Entry is not neces
    sary)":GOSUB 2670
CP  1480 IF IN$="" THEN A$=A$(F1,LEN(A$)-F
    2):GOTO 1360
VE  1490 GOTO 1690
TV  1500 REM UNDERLINE ENTRY
IF  1510 READ B$:? B$;"?"
UP  1520 GOSUB 2670:IF IN$="" THEN 1520
IZ  1530 DEP=F0:FOR A=F1 TO LEN(IN$):IN$(A
    ,A)=CHR$(ASC(IN$(A,A))+128):NEXT A:GOT
    O 1690
XP  1540 REM BACK-UP 2 IF NO ENTRY
TS  1550 READ B$:? B$;"?":? "  (Entry is n
    ot necessary)"
EJ  1560 GOSUB 2670:DEP=F0:IF IN$="" THEN
    DEP=F1:A$=A$(F1,LEN(A$)-F2):GOTO 1360
VA  1570 GOTO 1690
TY  1580 REM PUNCTUATION
IW  1590 READ B$:IF DEP AND TYPE=F7 THEN 1
    360
BI  1600 FOR A=F1 TO LEN(B$):C$=B$(A,A)
TJ  1610 IF C$="Q" THEN B$(A,A)=Q$
JV  1620 IF C$="C" THEN B$(A,A)=","
KC  1630 IF C$="_" THEN B$(A,A)=" "
CD  1640 NEXT A
BH  1650 IN$=B$:IF LEN(A$)=F0 THEN 1690
SM  1660 C$=A$(LEN(A$)):IF C$="." OR C$="!
    " OR C$="?" THEN A$(LEN(A$))=CHR$(ASC(
    C$)-128)
UR  1670 C$=A$(LEN(A$)):IF (C$="." OR C$="
    !" OR C$="?") AND B$(F1,F1)="." THEN I
    N$=B$(F2)
LZ  1680 REM BUILD A$
LI  1690 IF LEN(IN$)<F250-LEN(A$) THEN A$(
    LEN(A$)+F1)=IN$:GOTO 1360
DI  1700 ? :? "Source too long and not acc
    epted!":GOTO 1750
HN  1710 REM STOP
HM  1720 ? "Entry complete.":? "Are there
    any mistakes (Y=yes)?";:GOSUB 2580
RD  1730 IF NO THEN AMT=AMT+F1:J$(AMT*F250
    -F249)=A$:J$(LEN(J$)+F1)=BK$:GOTO 1220

ME  1740 ? "Incorrect source not accepted!
    "
VO  1750 ? :? "Press RETURN":INPUT A$:GOTO
     1220
BJ  1760 DATA Book,2,Last name of author,7
    ,C_,3,First name (and names of others)

NK  1770 DATA 7,.__,4,Title of book,6,.__,
    1,City printed in,6,:_
OC  1780 DATA 1,Printing company,6,C_,1,Ye
    ar printed,6,C_
EX  1790 DATA 5,Pages used (include p. or
    pp.),6,.,8
WH  1800 DATA Encyclopedia,2,Last name of
    author,7,C_,3,First name,7,.__,6,Q
VO  1810 DATA 1,Title of article,6,.Q__,4,
    Name of encyclopedia,6,.__
FA  1820 DATA 1,Year printed,6,_ed.,8
YE  1830 DATA Magazine,2,Last name of auth
    or,7,C_,3,First name,7,.__,6,Q
ZV  1840 DATA 1,Title of article,6,.Q__,4,
    Name of magazine,6,C_
QO  1850 DATA 1,Full date (date month year
    ),6,C_
CY  1860 DATA 1,Pages used (include p. or
    pp.),6,.,8
KD  1870 DATA Newspaper,2,Last name of aut
    hor,7,C_,3,First name,7,.__,6,Q
JO  1880 DATA 1,Title of article,6,.Q__,4,
    Name of newspaper,6,C_
SA  1890 DATA 1,Full date (date month year
    ),6,C_Sec._,1,Section,6,C_
CH  1900 DATA 1,Pages used (include p. or
    pp.),6,C_
KB  1910 DATA 1,Columns (include col. or c
    ols.),6,.,8
DR  1920 DATA Interview,1,Last name of per
    son,6,C_,1,First name,6,.__
AH  1930 DATA 1,Type (Personal or Telephon
    e),6,_interview.__
SK  1940 DATA 1,Full date (date month year
    ),6,.,8
FZ  1950 REM COMPOSE YOUR OWN
PL  1960 AMT=AMT+F1:? "   Compose your own
     bibliography"
TW  1970 ? :? "You must type-in the source
     in its    correct format."
VK  1980 ? :? "Press the INVERSE key at th
    e":? "beginning and end of an underlin
    ed"
QJ  1990 ? "area.":? :? "Use DELETE to mak
    e corrections.":? :STRT=AMT*F250-F250
YC  2000 FOR B=F1 TO 36:? "=";:NEXT B:? :A
    =F1
LY  2010 GET #F1,B
PX  2020 IF B<>126 THEN 2070
CA  2030 IF A<>F1 THEN ? CHR$(126);:A=A-F1

OU  2040 IF A=114 THEN RESTORE 2050:FOR C=
    F1 TO F5:READ D:? CHR$(D);:NEXT C
IV  2050 DATA 28,30,32,28,30
OF  2060 GOTO 2010
LN  2070 IF B=155 THEN 2110
OM  2080 IF B<32 OR B>250 OR (B>122 AND B<
    160) THEN 2010
SX  2090 J$(STRT+A)=CHR$(B):? #F6;CHR$(B);
    :A=A+F1
QO  2100 IF A<F249 THEN 2010
NV  2110 IF A=F1 THEN AMT=AMT-F1:GOTO 1220

EU  2120 J$(STRT+A)=BK$:GOTO 1220
AJ  2130 REM EDIT MENU
PF  2140 POKE 710,168:POKE F82,15:? CL$:?
    "EDIT MENU":? "==== ===="
CR  2150 POKE F82,F10:? :? "1. Move a sour
    ce":? "2. Delete a source":? "3. Alpha
    betical sort"
XM  2160 GOSUB 2470:TRAP 2140
FF  2170 IF A<F0 OR A>F3 THEN 2140
NK  2180 IF AMT+(A=F2)>F1 THEN ON A GOTO 2
    210,2310,2370
AQ  2190 ? "Not enough sources in memory."
    :WAIT=F1:GOTO 120
FL  2200 REM MOVE A SOURCE
RW  2210 ? "Which # source do you want to
    move    (1-";AMT;")?"
WS  2220 INPUT A:IF A>AMT OR A<F1 OR A<>IN
    T(A) THEN 2140
SA  2230 ? :? J$(A*F250-F249,A*F250)
IA  2240 ? :? "Where do you want to move i
    t?":INPUT B
ON  2250 TRAP 2820:IF B=A OR B>AMT OR B<F1
     OR B<>INT(B) THEN 2140
IL  2260 B$=J$(A*F250-F249)
WG  2270 IF A>B THEN FOR C=A-F1 TO B STEP
    -F1:J$(C*F250+F1,C*F250+F250)=J$(C*F25
    0-F249):NEXT C
FJ  2280 IF A<B THEN FOR C=A TO B-F1:J$(C*
    F250-F249,C*F250)=J$(C*F250+F1):NEXT C

RJ  2290 J$(B*F250-F249,B*F250)=B$:GOTO 24
    50
TY  2300 REM DELETE A SOURCE
UZ  2310 ? "Which # source do you want to
    delete  (1-";AMT;")?"
MH  2320 INPUT A:IF A<F1 OR A>AMT OR A<>IN
    T(A) THEN 2140
TT  2330 ? :? J$(A*F250-F249,A*F250):GOSUB
     2570:IF NO THEN 2140
MI  2340 AMT=AMT-F1:IF A>AMT THEN 2450
DR  2350 J$(A*F250-F249)=J$(A*F250+F1):GOT
    O 2450
AN  2360 REM ALPHABETIC SORT
KE  2370 ? "Working...":FOR A=F1 TO AMT-F1
    :POSITION 13,F1:? AMT-A;" ":FOR B=A+F1
     TO AMT
BT  2380 C=(J$(A*F250-F249,A*F250-F249)=Q$
    ):D=(J$(B*F250-F249,B*F250-F249)=Q$)
IA  2390 FOR E=F1+C TO F5+C:F=ASC(J$(A*F25
    0-F250+E,A*F250-F250+E)):B$(E-C)=CHR$(
```

```
   F-128*(F>=128)):NEXT E
QU 2400 FOR E=F1+D TO F5+D:F=ASC(J$(B*F25
   0-F250+E,B*F250-F250+E)):C$(E-D)=CHR$(
   F-128*(F>=128)):NEXT E
LC 2410 IF B$<=C$ THEN 2440
CM 2420 A$=J$(B*F250-F249):J$(B*F250-F249
   ,B*F250)=J$(A*F250-F249)
CT 2430 J$(A*F250-F249,A*F250)=A$
NT 2440 NEXT B:NEXT A
ZT 2450 ? :? "DONE!";:FOR A=F1 TO 60:NEXT
    A:GOTO 2140
NC 2460 REM GET A MENU OPTION
AI 2470 POSITION F10,14:POKE F82,F9:? "
     A - Main menu":? "        B - Entry men
   u":? "      C - Edit menu"
FW 2480 ? :? "Sources in memory: ";AMT
YF 2490 ? :? "Choose an option ->";
SI 2500 POKE 16,112:POKE 53774,112:POKE 7
   02,64:POKE F82,F2:GET #F1,A:IF A>=128
   THEN A=A-128:POKE 764,39
VA 2510 IF A>64 AND A<68 THEN A=A-37
MA 2520 IF A=28 THEN POP :GOTO 120
WB 2530 IF A=29 THEN POP :GOTO 1220
UU 2540 IF A=30 THEN POP :GOTO 2140
ZO 2550 ? CL$:A=A-48:TRAP 2820:RETURN
OA 2560 REM ARE YOU SURE?
WE 2570 ? :? "Are you sure (Y=yes)?";
CT 2580 YES=F0:NO=F0:GET #F1,B:IF B<>89 A
   ND B<>121 THEN ? "N":NO=F1:RETURN
VE 2590 ? "Y":? :YES=F1:RETURN
YW 2600 REM GET FILENAME
BM 2610 ? :? "D1:";:GOSUB 2670:IF NOT LE
   N(IN$) THEN ? "No entry made!":WAIT=F1
   :RETURN
WG 2620 IF LEN(IN$)<F4 THEN 2640
IT 2630 IF IN$(F1,F1)="D" AND IN$(F3,F3)=
   ":" THEN A$=IN$:GOTO 2650
VV 2640 A$="D1:":A$(F4)=IN$
CY 2650 TRAP 2830:RETURN
AF 2660 REM INPUT ROUTINE
HV 2670 IN$="":? ">";
NF 2680 GET #F1,B
UN 2690 IF B<>155 THEN 2730
FQ 2700 IF  NOT LEN(IN$) THEN 2800
EW 2710 IF IN$(LEN(IN$))<>" " THEN 2800
GH 2720 B=126
YK 2730 IF B<>126 OR  NOT LEN(IN$) THEN 2
   760
TE 2740 ? CHR$(126);:IF LEN(IN$)=F1 THEN
   IN$="":GOTO 2680
QU 2750 IN$=IN$(F1,LEN(IN$)-F1)
YX 2760 IF B>127 THEN B=B-128:POKE 764,39

MU 2770 IF B<32 OR B>122 OR (B=32 AND  NO
   T LEN(IN$)) THEN 2680
ZF 2780 IF LEN(IN$)<100 THEN IN$(LEN(IN$)
   +F1)=CHR$(B):? CHR$(B);
VJ 2790 GOTO 2680
YM 2800 FOR C=F1 TO F6:? :NEXT C:FOR C=F1
    TO F5:? CHR$(28);:NEXT C:? :RETURN
QI 2810 REM ERRORS
IF 2820 ? :? "ERROR #";PEEK(195);" at lin
   e ";PEEK(186)+PEEK(187)*256:WAIT=F1:PO
   P :GOTO 120
KB 2830 ? :? "Disk access error!":WAIT=F1
   :CLOSE #F2:RETURN
AP 2840 ? :? "Printer access error!":WAIT
   =F1:CLOSE #F3:RETURN
QD 2850 ? :? "Error in printing! Try del
   eting     source #";CNT:WAIT=F1:CLOSE
    #F3:RETURN
```

"master mind" challenge in 8-bit BASIC

HOT AND COLD

Article on page 29

LISTING 1

Don't type the TYPO II Codes!

```
IE 10 REM HOT AND COLD
DU 20 REM BY HEIDI BRUMBAUGH
PT 30 REM (c)1987, ANTIC PUBLISHING
NU 100 GOSUB 10000:REM INITIALIZE
JQ 120 FOR I=1 TO 4:X=INT(RND(0)*6)+1:S$(
   I)=CHR$(C(X)):NEXT I:TURN=1:REM NEW GA
   ME
UD 130 GOSUB 5000:REM DRAW BOARD
GF 132 REM GAME LOOP
QH 135 M=1:POKE 709,14:POKE 711,96
ZV 137 POSITION 14,8:? #6;"select":POSITI
   ON 14,10:? #6;M$
TP 140 POKE 77,0:FOR PEG=1 TO 4
ME 150 GOSUB 6000:REM GET GUESS FOR EACH
   PEG
FA 160 POSITION PEG+2,(TURN*2):? #6;CHR$(
   C(M))
OI 165 GUESS$(PEG)=CHR$(C(M)):X=2^2
SW 170 NEXT PEG
YL 172 GOSUB 1100:REM ERASE SELECT MENU
FE 180 REM CONFIRM GUESS
NB 190 POSITION 15,8:? #6;"OKAY":POSITION
    16,10:? #6;"??"
DH 200 POKE 711,14:POKE 710,157
YY 210 POSITION 14,12:? #6;"yes"
KM 220 POSITION 18,12:? #6;"NO"
ES 230 POKE 710,157:POKE 711,14
EZ 235 POSITION 14,13:? #6;"       "
UO 240 IF STRIG(0)=0 THEN 400
PV 250 POKE 77,0:IF STICK(0)<>7 THEN 240
EF 260 POKE 710,14:POKE 711,157
SP 265 POSITION 14,13:? #6;"      ■■"
FQ 270 POKE 77,0:IF STRIG(0)=0 THEN 300
JW 280 IF STICK(0)<>11 THEN 270
NQ 290 GOTO 230
MR 300 POSITION 3,(TURN*2):? #6;"     ":GO
   SUB 1000:X=2^2:GOTO 135
JB 400 GOSUB 1000:REM ERASE CONFIRM MSG.
RO 410 GOSUB 2000:REM EVALUATE GUESS
DJ 420 POSITION 8,(TURN*2):? #6;WHITE;" "
   ;BLACK
XW 430 IF BLACK=4 THEN 600:REM CHECK FOR
   WIN
TH 440 IF TURN<10 THEN TURN=TURN+1:GOTO 1
   35:REM CHECK FOR LOSS
BB 500 REM LOST
VD 510 POSITION 14,2:? #6;"better"
IO 520 POSITION 15,4:? #6;"luck"
BJ 530 POSITION 15,6:? #6;"next"
KY 540 POSITION 15,8:? #6;"time"
VO 545 POSITION 0,23:? #6;"the answer was
   ";S$
RS 550 GOSUB 3000
HU 560 POSITION 14,2:? #6;"      "
MN 570 POSITION 15,4:? #6;"    "
NX 580 POSITION 15,6:? #6;"    "
PH 590 POSITION 15,8:? #6;"    "
SL 592 POSITION 0,23:? #6;"
   "
NN 595 GOTO 120
QA 600 REM WON
CM 605 POSITION 15,3:? #6;"good"
YN 610 POSITION 15,5:? #6;"job!"
RN 620 GOSUB 3000
LP 630 POSITION 15,3:? #6;"    "
MZ 640 POSITION 15,5:? #6;"    "
MR 650 GOTO 120
XJ 1000 POSITION 15,8:? #6;"    "
YF 1010 POSITION 16,10:? #6;"  "
XY 1020 POSITION 14,12:? #6;"      "
YU 1030 POSITION 14,13:? #6;"      "
AL 1040 RETURN
GI 1100 POSITION 14,8:? #6;"      ":POSIT
   ION 14,10:? #6;"  "
AE 1110 RETURN
YM 2000 REM COUNT WHITES AND BLACKS
SH 2010 WHITE=0:BLACK=0:D$=S$
XR 2020 FOR I=1 TO 4
EV 2030 IF D$(I,I)=GUESS$(I,I) THEN BLACK
   =BLACK+1:D$(I,I)=" ":GUESS$(I,I)=" "
FC 2040 NEXT I
YA 2050 FOR I=1 TO 4
FE 2060 IF GUESS$(I,I)=" " THEN 2100
YQ 2070 FOR J=1 TO 4
IT 2080 IF D$(J,J)=GUESS$(I,I) THEN WHITE
```

continued on next page

```
   =WHITE+1:D$(J,J)=" ":GOTO 2100
GC 2090 NEXT J
ES 2100 NEXT I
AF 2110 RETURN
LJ 3000 REM PLAY AGAIN?
WI 3010 POSITION 14,12:? #6;"BUTTON"
BH 3020 POSITION 16,14:? #6;"TO":POSITION
    15,16:? #6;"PLAY"
EP 3030 IF STRIG(0)=1 THEN 3030
LB 3040 POKE 77,0:POSITION 14,12:? #6;"
     "
RX 3050 POSITION 16,14:? #6;"  ":POSITION
    15,16:? #6;"    "
FY 3060 X=2^2:RETURN
QI 5000 REM DRAW BOARD
UD 5005 GRAPHICS 1+16
RV 5007 POKE 708,30:POKE 712,148
XU 5010 POSITION 2,0:? #6;"GUESS W H"
CD 5030 FOR I=2 TO 20 STEP 2
YS 5040 POSITION 0,I:? #6;INT(I/2)
FI 5050 NEXT I
QR 5060 FOR I=1 TO 11:POSITION 12,I*2-2:?
    #6;MASTER$(I,I):NEXT I
AF 5100 RETURN
QA 6000 REM SELECT PEG
NU 6005 POKE 77,0:IF STRIG(0)=0 THEN 6005
ZN 6010 POSITION 13+M,10:? #6;CHR$(ASC(M$
   (M))+128)
MW 6020 POKE 77,0:IF STRIG(0)=0 THEN 6500
AD 6030 MOVE=STICK(0):IF MOVE<>7 AND MOVE
   <>11 THEN 6020
NB 6040 IF MOVE=7 AND M=6 OR MOVE=11 AND
   M=1 THEN 6020:REM OUT OF RANGE
IV 6045 POKE 53279,3:X=1^1
YI 6050 POSITION 13+M,10:? #6;M$(M)
LS 6060 IF MOVE=7 THEN M=M+1:GOTO 6010
YO 6070 M=M-1:GOTO 6010
NA 6500 POKE 77,0:IF STRIG(0)=0 THEN 6500
AR 6510 RETURN
ZJ 10000 DIM S$(4),C(6),M$(6),GUESS$(4),D
   $(4),MASTER$(11)
WQ 10010 FOR I=1 TO 6:READ X:C(I)=X:M$(I)
   =CHR$(X+128):NEXT I:MASTER$="!!!!!!!!!
   !!"
DA 10100 RETURN
XW 15000 DATA 4,10,11,3,1,28
```

---

trip planner saves $$$

YOUR BEST ROUTE

Article on page 39

LISTING 1

Don't type the TYPO II Codes!

```
FZ 10 REM TRAVEL PLANNER
KO 20 REM BY J. SUMMERS
PT 30 REM (c)1987, ANTIC PUBLISHING
NH 98 GOSUB 20000
GU 99 GOTO 10000
YY 100 REM GETNUM
HL 110 GOSUB 300:POKE 752,1:POSITION PCOL
   ,PROW:? CHR$(30);CHR$(31);:EXT=0
PF 115 POKE 752,0:? " ";
NN 120 GET #1,X:IF X=155 THEN 230
IW 122 IF X=126 THEN 160
VO 124 IF X=82 THEN RECIP= NOT RECIP:GOTO
    110
NP 126 IF X=69 OR X=27 THEN EXT=1:RETURN
RU 128 IF X>57 THEN 120
WI 130 IF (X>47) OR (X=46) THEN 160
QW 132 IF X=32 THEN 160
OC 134 IF X>31 THEN 120
QF 136 IF X<28 THEN 120
LP 140 ON X-27 GOTO 190,200,210,220
TR 150 STOP
XX 160 ? CHR$(X);:GOTO 120
FV 190 DDIRECT=4:GOTO 230
EE 200 DDIRECT=2:GOTO 230
ET 210 DDIRECT=3:GOTO 230
TT 220 DDIRECT=1
IN 230 POKE 752,1:R$="        ":FOR I=0 T
   O 7:LOCATE PCOL+I,PROW,X:IF X>127 THEN
    X=X-128
FJ 235 R$(I+1)=CHR$(X):NEXT I
VO 240 VALUE=VAL(R$):RETURN
OK 300 REM DISPLAY
JU 310 ? CL$;HEAD$;RONOFF$(1+5*RECIP,5+5*
   RECIP)
NC 320 ? ,:FOR I=LEFTCOL TO LEFTCOL+2:? L
   OC$((I-1)*8+1,I*8),:NEXT I
BB 330 POSITION 2,2:? LINE$
JS 340 FOR I=1 TO NLOC:POSITION 2,I+3:? L
   OC$(8*(I-1)+1,8*I),
VG 350 FOR J=LEFTCOL TO LEFTCOL+2:? TABLE
   (J,I),:NEXT J:NEXT I
ZL 360 RETURN
MT 500 IF  NOT BRK THEN POKE 16,112:POKE
   53774,112
ZD 510 RETURN
ED 800 CLOSE #5:OPEN #5,6,0,"D:*.*":? CL$
   ;"     directory"
OU 810 TRAP 850
DP 820 GET #5,X:IF X=155 THEN ? "  ";:GOT
   O 820
IA 830 PUT #16,X:GOTO 820
IS 850 CLOSE #5:? :? "Press any key for m
   enu"
KA 860 GET #1,X:GOTO 10025
QV 1000 REM CREATE TABLE
ES 1005 TRAP 1005:GRAPHICS 0:POKE 710,2:P
   OKE 709,188:GOSUB 500
GL 1010 POSITION 5,10:? "Enter number of
   locations: ";:INPUT #16,NLOC
WG 1020 IF NLOC<3 OR NLOC>20 THEN 1010
LR 1025 FOR I=1 TO NLOC:FOR J=1 TO NLOC:T
   ABLE(I,J)=0:NEXT J:NEXT I
CB 1030 FOR I=1 TO NLOC:? "Enter name of
   location":? "8 characters max ________
   ←←←←←←←←";
GV 1040 RPOS=1
LS 1041 GET #1,X:IF X=155 THEN 1050
NZ 1042 IF X=126 AND RPOS>1 THEN RPOS=RPO
   S-1:PUT #16,X:GOTO 1041
AL 1045 R$(RPOS)=CHR$(X):PUT #16,X:RPOS=R
   POS+1:IF RPOS<9 THEN 1041
AD 1050 ? :IF LEN(R$)<8 THEN R$(LEN(R$)+1
   )="       "
GB 1060 LOC$(8*(I-1)+1,8*I)=R$:NEXT I
NY 1070 LEFTCOL=1:LCOL=1:LROW=1:PCOL=10:P
   ROW=4:RECIP=1
TI 1075 IF NLOC=0 THEN 4005
AZ 1080 DDIRECT=1
YS 1090 GOSUB 100:IF EXT THEN GOTO 10025
YN 1100 TABLE(LCOL,LROW)=VALUE:IF RECIP T
   HEN TABLE(LROW,LCOL)=VALUE
QL 1110 ON DDIRECT GOTO 1120,1130,1140,11
   50
CD 1120 LCOL=LCOL+1:IF LCOL>NLOC THEN LCO
   L=NLOC:GOTO 1090
DZ 1122 IF LCOL>LEFTCOL+2 THEN LEFTCOL=LE
   FTCOL+1:GOTO 1090
XX 1125 PCOL=PCOL+10:GOTO 1090
FQ 1130 LROW=LROW+1:IF LROW>NLOC THEN LRO
   W=NLOC:GOTO 1090
QB 1135 PROW=PROW+1:GOTO 1090
CH 1140 LCOL=LCOL-1:IF LCOL<1 THEN LCOL=1
   :GOTO 1090
WS 1142 IF LCOL<LEFTCOL THEN LEFTCOL=LEFT
   COL-1:GOTO 1090
ZH 1145 PCOL=PCOL-10:GOTO 1090
CU 1150 LROW=LROW-1:IF LROW<1 THEN LROW=1
   :GOTO 1090
RL 1155 PROW=PROW-1:GOTO 1090
FA 2000 POKE 752,0:POKE ADL+6,7:REM LOAD
   TABLE
DP 2010 ? CL$;"        load               T
   ABLE":POSITION 3,10:? "Enter filename
   to load using format"
MS 2020 ? "         <dev>:<filename>.<ext>
   ":? :? "          ┌──────────────────┐"
XF 2021 ? "          │                  │":?
    "        └──────────────────┘"
ZU 2022 POSITION 4,18:? "(or press [RETUR
   N] for directory)":POSITION 13,14:? "←
   →";
RI 2023 POKE 752,1:INPUT #16,R$
TP 2024 IF R$(1,2)="  " THEN 800
DS 2030 TRAP 2900:CLOSE #2:OPEN #2,4,0,R$
BF 2040 TRAP 2950:INPUT #2,R$:IF R$<>KEY$
```

```
   THEN 2950
LR 2050 INPUT #2,NLOC:LOC$(1)=" ":LOC$(16
   0)=" ":LOC$(2)=LOC$(1):FOR I=1 TO NLOC

IH 2060 INPUT #2,R$:LOC$(8*(I-1)+1,8*(I-1
   )+LEN(R$))=R$
HI 2070 NEXT I:FOR COL=1 TO NLOC:FOR ROW=
   1 TO NLOC:INPUT #2,X:TABLE(COL,ROW)=X:
   NEXT ROW:NEXT COL
JZ 2090 CLOSE #2:GOTO 10025
QY 2900 TRAP 2960:POKE 710,52:? :? "Error
    on opening file":CLOSE #2:GOTO 2960
AG 2950 POKE 710,52:? :? "File not compat
   able with this program":CLOSE #2
LY 2960 ? "Press any key for menu";:GET #
   1,X:GOTO 10025
ZW 3000 POKE 752,0:POKE ADL+6,7:REM SAVE
   TABLE
TF 3009 IF NLOC=0 THEN 4005
PF 3010 ? CL$;"        save            T
   ABLE":POSITION 3,10:? "Enter filename
   to load using format"
MT 3020 ? "        <dev>:<filename>.<ext>
   ":? :? "            ┌──────────────────────┐"
XG 3021 ? "            │                      │":?
    "          └──────────────────────┘"
ZV 3022 POSITION 4,18:? "(or press [RETUR
   N] for directory)":POSITION 13,14:? "→
   →";
RJ 3023 POKE 752,1:INPUT #16,R$
TQ 3024 IF R$(1,2)="  " THEN 800
QO 3030 TRAP 2900:CLOSE #2:OPEN #2,8,0,R$
   :? #2;KEY$:? #2;NLOC
HD 3031 FOR I=1 TO NLOC:? #2;LOC$(8*(I-1)
   +1,8*I)
BT 3040 NEXT I:FOR COL=1 TO NLOC:FOR ROW=
   1 TO NLOC:? #2;TABLE(COL,ROW):NEXT ROW
   :NEXT COL
JO 3050 CLOSE #2:GOTO 10025
MH 3500 REM EDIT TABLE
II 3505 TRAP 3505:GRAPHICS 0:POKE 710,2:P
   OKE 709,188:GOSUB 500
QQ 3510 GOTO 1070
JA 4000 REM SOLVE TABLE, PLAN THE TRIP
JJ 4005 IF NLOC=0 THEN POKE 710,52:? "No
   table in memory":GOTO 2960
XT 4010 ? CL$;"  plan the trip":?
GE 4020 FOR I=1 TO NLOC:? ,I;"   ";LOC$(8
   *(I-1)+1,8*I):NEXT I
DF 4030 TRAP 4030:POSITION 2,21:? "Enter
   number of starting location: "
QA 4032 INPUT #16,SLOC:IF SLOC<0 OR SLOC>
   NLOC THEN 4030
NW 4034 POSITION 8,SLOC+1:? "S"
SI 4035 TRAP 4035:POSITION 2,21:? "Enter
   number of final location:      "
KR 4040 INPUT #16,ELOC:I=1:IF ELOC<0 OR E
   LOC>NLOC THEN 4035
QK 4041 POSITION 9,ELOC+1:? "E"
CQ 4042 TRAP 4042:POSITION 1,20:? " Enter
    number of location to visit,"
WW 4050 ? "end with 0:
    ":? "  ";:POSITION 15,21:? "→→";
EO 4060 INPUT #16,VLOC:IF VLOC<0 OR VLOC>
   NLOC THEN 4042
OC 4065 VISIT(I)=VLOC:I=I+1:IF I>NLOC THE
   N 4100
ZZ 4066 POSITION 10,VLOC+1:? "■"
WS 4070 IF VLOC>0 THEN 4042
DD 4100 ? CL$;:POSITION 1,0:? "optimal tr
   ip route":POKE 710,22
RK 4110 IF SLOC THEN ? "Start at    ";LOC
   $(8*(SLOC-1)+1,8*SLOC)
XZ 4115 IF I<=2 THEN CURTOT=TABLE(SLOC,EL
   OC):GOTO 4411
OA 4119 FOR J=1 TO 10:V(J)=0:NEXT J:I=I-2
   :CURTOT=999999999:FOR J=1 TO I:V(J)=I-
   J+1:NEXT J
OC 4200 TRAP 40000
JL 4219 TOT=0:FOR J=1 TO I-1:TOT=TOT+TABL
   E(VISIT(V(J)),VISIT(V(J+1))):NEXT J
AB 4220 TOT=TOT+TABLE(SLOC,VISIT(V(1)))+T
   ABLE(VISIT(V(I)),ELOC)
YS 4222 IF PEEK(764)=33 THEN POKE 559,34-
   PEEK(559):POKE 764,255
BW 4225 IF TOT<CURTOT THEN 4500
IF 4230 INDEX=1
SR 4235 V(INDEX)=V(INDEX)+1:IF V(INDEX)>I
    THEN V(INDEX)=1:INDEX=INDEX+1:GOTO 42
   35
TN 4240 IF INDEX>I THEN 4400
MJ 4250 FOR J=1 TO I
KT 4260 FOR K=1 TO I:IF (K<>J) AND (V(K)=
   V(J)) THEN POP :POP :GOTO 4230
YB 4270 NEXT K:NEXT J
VH 4280 GOTO 4219
VH 4400 FOR J=1 TO I:? "go to","  ";LOC$(
   8*(VISIT(FTRIP(J))-1)+1,8*VISIT(FTRIP(
   J)))
FO 4410 NEXT J
EK 4411 IF ELOC THEN ? "End at        ";LOC
   $(8*(ELOC-1)+1,8*ELOC)
IG 4415 ? "Total mileage: ";CURTOT
ER 4420 POKE 710,2:? "Press any key for m
   enu"
NL 4425 POKE 559,34:FOR X=75 TO 20 STEP -
   1:SOUND 0,X,14,14:NEXT X:SOUND 0,0,0,0
   :POKE 764,255
JW 4430 GET #1,X:GOTO 10025
PH 4500 FOR J=0 TO 9:FTRIP(J)=V(J):NEXT J
   :CURTOT=TOT
QW 4510 GOTO 4230
RW 9999 STOP
FC 10000 DIM TABLE(20,20),LOC$(160),HEAD$
   (30),RONOFF$(10),LINE$(37),R$(30),CL$(
   1),KEY$(16)
VC 10005 SOUND 0,0,0,0
TP 10010 DIM FTRIP(10),V(10),VISIT(20),SP
   $(10)
ZD 10011 CL$=CHR$(125):LINE$(1)="-":LINE$
   (37)="-":LINE$(2)=LINE$(1):LOC$(1)=" "
   :LOC$(160)=" ":LOC$(2)=LOC$(1)
QW 10012 RONOFF$="R OFFR  ON":HEAD$="Trav
   el Planner by J. Summers ":KEY$="\SUMM
   ERS\TRAVEL\"
DT 10013 SP$="        "
XP 10015 POKE 559,34:BRK=0:IF PEEK(53279)
   =5 THEN BRK=1
RP 10020 CLOSE #1:OPEN #1,4,0,"K:":CLOSE
   #2
IS 10025 GRAPHICS 0:POKE 710,2:POKE 709,1
   88:PRINT CL$;
OR 10026 GOSUB 500:ADL=PEEK(560)+256*PEEK
   (561):POKE ADL+3,PEEK(ADL+3)+5:POKE AD
   L+6,6
KZ 10027 ? "  travel planner        BY J. S
   UMMERS"
YT 10030 ? :? SP$;"Select option by numbe
   r":?
EI 10040 ? SP$;"0 - Exit":? SP$;"1 - Crea
   te table":? SP$;"2 - Load a table"
NZ 10045 ? SP$;"3 - Save current table"
LV 10050 ? SP$;"4 - Edit current table":?
    SP$;"5 - Find shortest trip":? :? SP$
   ;"Select: ";
PH 10060 TRAP 10025:INPUT #16,OPTION
WT 10065 TRAP 40000
GX 10070 IF OPTION=0 THEN GRAPHICS 0:END
PV 10080 IF OPTION>5 THEN 10025
XB 10090 ON OPTION GOTO 1000,2000,3000,35
   00,4000
MC 20000 GRAPHICS 7+16:DLIST=PEEK(560)+25
   6*PEEK(561):POKE DLIST+3,71:POKE DLIST
   +6,6
ML 20005 SCRMEM=PEEK(88)+256*PEEK(89)
BI 20030 LM=0:RM=159:UM=3:BM=90
JJ 20040 X=RM/2:Y=BM/2
DB 20100 RETURN
```

ST RESOURCE

Article on page 55

TAP THE POWER OF YOUR SYSTEM CLOCK

LISTING 1

```
1000    '
1010    GETTIME :
1020    '(c) 1987 Antic Publishing
1030    'Version 010887
1040    'Written by Stephen Oriold
1050    '
1060    Dim OPCODE%(23)
1070    '
1080    '
1090    restore 1340
```

continued on next page

```
1100 '
1110 for C%=0 to 23
1120 read OPCODE%(C%)
1130 next C%
1140 '
1150 ADDR = varptr(OPCODE%(0))
1160 call ADDR
1170 '
1180 HRS% = OPCODE%(23)
1190 MIN% = OPCODE%(22)
1200 SEC% = OPCODE%(21)
1210 '
1220 HRS$ = str$(HRS%)
1230 if len(HRS$) = 2 then HRS$ = " 0" + right$(HRS$, 1)
1240 MIN$ = str$(MIN%)
1250 if len(MIN$) = 2 then MIN$ = " 0" + right$(MIN$, 1)
1260 SEC$ = str$(SEC%)
1270 if len(SEC$) = 2 then SEC$ = " 0" + right$(SEC$, 1)
1280 '
1290 TIME$ = right$(HRS$, 2) + ":" + right$(MIN$, 2)
1300 TIME$ = TIME$ + ":" + right$(SEC$, 2)
1310 print TIME$
1320 input "- Hit [RETURN] to exit.", A$
1330 '
1340 data &H2248, &H3F3C, &H002C, &H4E41, &H548F, &H3200
1350 data -15748, &H001F,  -7351, &H3341, &H002A,  -5560
1360 data &H3340, &H002C, &H0269, &H003F, &H002C,  -5048
1370 data &H3340, &H002E, &H4E75, &H0000, &H0000, &H0000
```

LISTING 2

```
C P / M   6 8 0 0 0   A s s e m b l e r     Revision 04.03     Page    1
Source File: B:TIME.S

  1 00000000 2248                     MOVE.L  A0, A1
  2 00000002 3F3C002C                 MOVE.W  #$2C, -(A7)
  3 00000006 4E41                     TRAP    #1
  4 00000008 548F                     ADDQ.L  #2, A7
  5 0000000A 3200                     MOVE.W  D0, D1
  6 0000000C C27C001F                 AND.W   #%11111, D1
  7 00000010 E349                     LSL.W   #1, D1
  8 00000012 3341002A                 MOVE.W  D1, $2A(A1)
  9 00000016 EA48                     LSR.W   #5, D0
 10 00000018 3340002C                 MOVE.W  D0, $2C(A1)
 11 0000001C 0269003F002C             AND.W   #%111111, $2C(A1)
 12 00000022 EC48                     LSR.W   #6, D0
 13 00000024 3340002E                 MOVE.W  D0, $2E(A1)
 14 00000028 4E75                     RTS
 15
```

LISTING 3

```
'
' Time and Date setting program
' (c) 1987 Antic Publishing
' version 072887
' Written by Patrick Bass
'
' - - - - - - - - - - - - - -
'
@Get_the_date
@Get_the_time
Print
Alert 0,"Time: "+Time$+" |Date: "+Date$+" | ",1,"Exit",Button
'
End
'
' ---------------------------
Procedure Get_the_date
  Repeat
    Cls
    Print " Enter Today's Date"
    '
    Print At(2,3);" Date format: mm/dd/yyyy  (";Date$;")"
    Let Current_date$=""
    Print At(2,4);"Today's date: ";
    Let Selected=False
    '
    Repeat
      @Handle_d_key
    Until Selected
    '
    Let Month$=Left$(Current_date$,2)
    Let Day$=Mid$(Current_date$,4,2)
    Let Year$=Right$(Current_date$,4)
    '
    If Month$>="01" And Month$<="12"
      If Day$>="01" And Day$<="31"
        If Year$>="1980" And Year$<="2099"
          Let Proper_date_format=True
          Let Year=(Val(Year$)-1980)
          Let Month=(Val(Month$))
          Let Day=(Val(Day$))
          Let Datein%=(Year*512)+(Month*32)+Day
          Let X=Gemdos(43,W:Datein%)
        Endif
      Endif
    Endif
    '
    If Not Proper_date_format
      Let Current_date$=""
      Let D1=0
    Endif
    '
  Until Proper_date_format
Return
'
' -----------------------------------
Procedure Handle_d_key
  '
  Let Keyd$=Inkey$
    Let Selected=True
  Endif
  '
  If Keyd$>="0" And Keyd$<="9"
    If Len(Current_date$)<10
      Let Current_date$=Current_date$+Keyd$
      '
      If Len(Current_date$)=2 Or Len(Current_date$)=5
        Let Current_date$=Current_date$+"/"
        Let D1=Len(Current_date$)
      Endif
      '
    Endif
    Print At(16,4);"                              ";
    Print At(16,4);Current_date$;
  Endif
  '
Return
'
' ----------------------------------
Procedure Get_the_time
  Repeat
    Cls
    Print At(2,2);"Enter The Current Time in 24 Hour Format"
    '
    Print At(2,3);" Time format: hh:mm:ss  (";Time$;")"
    Let Current_time$=""
    Print At(2,4);"Current Time: ";
    Let Selected=False
    '
    Repeat
      @Handle_t_key
    Until Selected
    '
    Let Hour$=Left$(Current_time$,2)
    Let Minute$=Mid$(Current_time$,4,2)
    Let Second$=Right$(Current_time$,2)
    '
    If Hour$>="00" And Hour$<="23"
      If Minute$>="00" And Minute$<="59"
        If Second$>="00" And Second$<="59"
          Let Proper_time_format=True
          Let Hours=(Val(Hour$))
          Let Minutes=(Val(Minute$))
          Let Seconds=(Val(Second$))
          Let Time_in%=(Hours*2048)+(Minutes*32)+(Seconds/2)
          Let X=Gemdos(45,W:Time_in%)
        Endif
      Endif
    Endif
    '
    If Not Proper_time_format
      Let Current_time$=""
      Let T1=0
    Endif
    '
  Until Proper_time_format
Return
'
' ------------------------------------
Procedure Handle_t_key
  '
  Let Keyt$=Inkey$
  '
  If Keyt$=Chr$(13)
    Let Selected=True
  Endif
  '
  If Keyt$>="0" And Keyt$<="9"
    If Len(Current_time$)<8
      Let Current_time$=Current_time$+Keyt$
      '
      If Len(Current_time$)=2 Or Len(Current_time$)=5
        Let Current_time$=Current_time$+":"
        Let T1=Len(Current_time$)
      Endif
      '
    Endif
    Print At(16,4);"                              ";
    Print At(16,4);Current_time$;
  Endif
  '
Return
'
' -- End of program ---------------------
```

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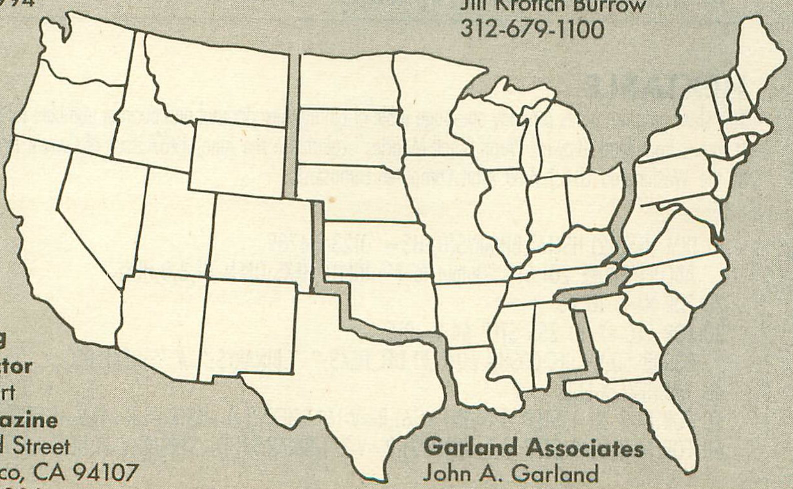
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By Gregg Pearlman, Antic Assistant Editor

FLASH BORDER

Pep up your BASIC text display by surrounding it with a flashy, moving border. This routine was sent to **Antic** by Agim Perolli of Boonton, NJ:

```
10 GRAPHICS 0:FOR P=1536 TO 1638:READ X:POKE P,X:NEXT P
20 DATA 162,0,189,0,224,157,0,120,189,0,225,157,0,121,189,0,226,157,0,122
30 DATA 189,0,227,157,0,123,232,224,255,208,227,162,120,142,244,2,104,
   162,6,160
40 DATA 46,169,7,76,92,228,174,89,6,228,20,208,33,162,0,135,20,174,90,6
50 DATA 142,66,6,160,0,185,91,6,153,0,121,200,192,8,208,245,232,224,95,208
60 DATA 2,162,91,142,90,6,76,98,228,3,91,102,204,153,51,102,204,153,51,102
70 DATA 204,153,51
80 ? :? :? :? :?" @@@@@@@@@@@@@@@@@@@@@@"
90 FOR L=1 TO 5:?" @                    @ ":NEXT L
100 ?" @@@@@@@@@@@@@@@@@@@@@@"
110 DUMMY=USR(1536)
```

XL MEMORY EATER

Want to watch your Atari 800XL eat memory? Type in:

```
10 IF PEEK(53279)<>7 THEN END
20 SAVE "D:JUNK.BAS"
30 SAVE "S:"
40 ? :? :? FRE(0)
50 RUN "D:JUNK.BAS"
```

This short program by **Antic** Technical Editor Charles Jackson demonstrates a little-known problem that readers regularly ask us about. The operating system (OS) built into XL computer models adds 16 "garbage" bytes to the end of your Atari BASIC program every time you SAVE it to disk or cassette.

When you RUN this program, it will SAVE itself to disk over and over again. Each time the program SAVEs itself, it displays the amount of available memory bytes. Notice that this value decreases by 16 each time around.

Line 30 lets you *see* these extra bytes for yourself. The SAVE "S:" command tells your Atari to SAVE your program to the S:—Screen device. In other words, the tokenized version of your program is displayed onscreen each time it is SAVEd. You can actually watch it grow and grow. Hold down any console key to stop the program.

This program will eventually fill your disk (and probably crash it, too). So you should RUN it on a "scratch" disk that doesn't contain other material you might want to keep.

If you're editing a standard BASIC program on an Atari XL, remember that 16 "garbage" bytes will be added to your program each time you SAVE it. But fortunately, you can remove these bytes from your program in four steps!

Here's the cure:

1. LIST your program to disk.
2. Type NEW.
3. ENTER your program back into the computer.
4. SAVE it back to disk. The "garbage" bytes have been removed.

DOS CHECKUP

William Ho of Calgary, Alberta, Canada sent us this simple routine that lets you check which version of Atari DOS is active:

```
10 IF PEEK(1995)=170 THEN ?"DOS 2.0s"
20 IF PEEK(1995)=100 THEN ?"DOS 2.5"
30 IF PEEK(1995)=29 THEN ?"DOS 3.0"
```

And to check which version of Atari BASIC you have, type:

PRINT PEEK(43234)

VALUE RETURNED BY YOUR ATARI	BASIC VERSION
162	A
96	B
234	C

ANOTHER XL RAMDISK

Here's how to create a 101-sector RAMdisk while working in BASIC on your 800XL. This tip has appeared in several users group newsletters, including the April, 1987 the Northwest Phoenix (Arizona) Atari Connection's Between Bytes.

This method is different from the January, 1987 RAMdisk Tech Tip which is written to your DOS 2.5 disk as an AUTORUN.SYS file. The following steps for this 101-sector RAMdisk must be repeated whenever you want to use it:

1. *Boot your 800XL with a DOS 2.5 disk containing RAMDISK.COM.*
2. *Type POKE 1802,PEEK(1802)+128 and press [RETURN].*
3. *Type DOS and press [RETURN].*
4. *Press [L] and [RETURN]. Type RAMDISK.COM and press [RETURN].*
5. *Press the following: [I] [RETURN] [8] [RETURN] [Y] [RETURN].*
6. *Press the following: [H] [RETURN] [8] [RETURN] [Y] [RETURN].*
7. *Press [D] and [RETURN]. Type D8: DOS.SYS and presss [RETURN] [Y] [RETURN].*
8. *Press [B] and [RETURN].*
9. *Type POKE 5439,56 and press [RETURN].*
10. *Type DOS and press [RETURN].*

You should now see the DOS menu almost instantly. You can store anything on drive 8 if *(A.) it fits and (B.) you copy it to a regular disk before turning your computer off.*

From the DOS menu, if you press [N] and [RETURN], MEM.SAV will be created on drive 8.

If you have a Tech Tip that you would like to share with other readers, send it along to Antic Tech Tips, 544 Second Street, San Francisco, CA 94107. You might get your name in print. We always welcome very short programs that demonstrate the Atari's powers, simple hardware modifications, or useful macros for popular software.

HEXTABLE

This short program prints a handy one-page table of binary, hexadecimal and decimal numbers for instant conversion. It comes from Mark Brown's "Atari Small Miracles" column in the June, 1987 issue of Current Notes, the magazine of the Washington (D.C.) Area Atari Computer Enthusiasts.

```
10 DIM HEX$(2),H$(16),BINARY$(8):H$="0123456789
   ABCDEF":POKE 201,5:? "Output to ?";:INPUT HEX$:OPEN #1,8,0,HEX$
20 FOR X=0 TO 63
30 FOR DEC=X TO 255 STEP 64:V=DEC:
   GOSUB 50:V=DEC:GOSUB 60:? #1;DEC,HEX$;" ";BINARY$;" # ";:NEXT DEC
40 ?#1:NEXT X:END
50 FOR I=2 TO 1 STEP -1:T=INT(V/16):R=V-16*T:HEX$(I,I)=H$(R+1,R+1):V=T:NEXT I:RETURN
60 FOR I=8 TO 1 STEP -1:T=INT(V/2):R=V-2*T:BINARY$(I,I)=STR$(R):V=T:NEXT I:RETURN
```

At the "Output to ?" prompt, enter a device such as P: (printer), or S: (screen).

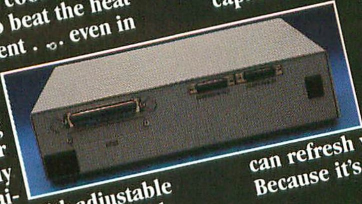


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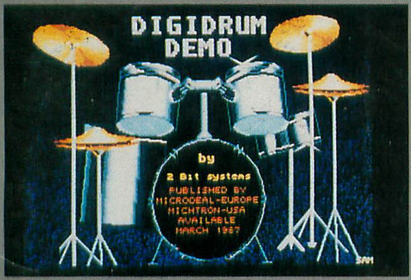


ST-Replay comes with a cartridge that connects directly to the cartridge port of the Atari ST, and is capable of sampling sound from any source similar to a cassette player, HI-FI, or compact disc player. *ST-Replay* also accepts amplified sources, so the cleaner the sound the better the sample.

All of this only begins to describe the incredible power of this utility. You can save samples to disk, load from a disk, change the speed of a sample, cut and paste areas of a sample, and much, much more!

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DIGI-DRUM



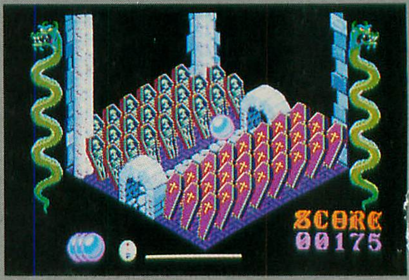
Turn your Atari ST into a sizzling digitized drum machine with Digi-Drum. From the cool syncopated beat of a jazz improvisation to the martial flare of a staccato snare, you can experience it all, digitally, with this amazing program. Also Digi-Drum is compatible with the sound digitizer ST-Replay (see above).

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